ADOLESCENTS WITH PHYSICAL IMPAIRMENTS: METACOGNITIVE PROCEDURES IN THE ACQUISITION AND GENERALIZATION OF NONVERBAL COMMUNICATION BEHAVIORS

By

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Abstract of Dissertation Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

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Adolescents with physical impairments (PI) exhibit a diverse range of physical, health, cognitive, communicative, sensory, and psychosocial abilities that affect their interactions with other individuals. Nonverbal communication behaviors (NCBs) are one aspect of interactions in which dysfunctional patterns are evident between individuals with various physical impairments and nonhandicapped persons. Although NCB training has been recommended for individuals with PI, specific training procedures have not been reported.

A nonverbal communication training procedure was developed for use with adolescents with PI. Principles from metacognition and motivation research related to increasing students' situational performance and the likelihood of transferring learned behaviors to new situations were included. A multiple baseline single subject design across behaviors (N=3) was used to evaluate the effects of the procedure on the

acquisition and generalization of NCBs. The effects of the procedure on the level, variability, and trend of NCB performance during training sessions and education conferences were investigated. Social validation measures were obtained from subjects and their teachers.

The procedure consisted of training subjects to use a strategy to determine an individualized manner of performing NCBs based on an analysis of personal abilities and NCB components. An acronym, IMAGES, was used to facilitate the subjects' recall of the problem-solving steps. The NCBs included sitting-up-straight, position of arms and hands, forward lean, eye contact, smiling, and head nods. Data from each subject were displayed related to level, variability, and trend.

The subjects (N=5), ages 13-16 years, attended some classes in a program for students with PI. Intellectual functioning was within normal limits.

Effects of the NCB training procedure on the acquisition and generalization of NCBs for adolescents with PI were positive. Subjects exhibited the newly acquired NCBs during training sessions and were able to generalize them to education conferences. Subjects and teachers expressed satisfaction with the IMAGES strategy training in terms of importance, effectiveness, and practicality. Implications were presented for NCB training procedures and generalization issues for adolescents with PI.

CHAPTER I
INTRODUCTION

The breadth of educational services for children and youth with physical impairments has expanded dramatically since the end of the nineteenth century when classes for crippled children were first established in larger cities in the United States (Connor, Scandary, & Tulloch, 1988; Dykes, 1986). The growth in educational opportunities for youth with physical impairments has paralleled and overlapped the expansion of education programs for other exceptional youth such as those suspected of having brain injury (Mercer, 1987). The commitment at the federal level to education services for students with handicaps has included students with physical impairments specifically. Since the passage of The Education for All Handicapped Children Act in 1975, the initiative to provide more comprehensive educational programming to students with handicaps has continued through provisions included in Public Law 99-457 and more recently Senate Bill 101-204 (Kennedy, 1989).

Due to the presence and nature of physically disabling conditions, the educational needs of students with physical impairments have been somewhat different than the needs of other exceptional populations. Adolescents with physical impairments

exhibit a diverse range of physical, health, cognitive, speech, sensory, and psychosocial abilities. These students have been included in the categories orthopedically impaired and other health impaired within the rules and regulations of Public Law 94-142. The emphasis in the PL 94-142 definitions has been on the physical conditions that may affect educational performance. Students with physical impairments may also have associated cognitive, sensory, or social-emotional problems that must be considered in educational planning (Bigge & Sirvis, 1978; Jones, 1983; Lyle & Obringer, 1983; Simeonsson, 1986; Sirvis, 1978; Williamson, 1987).

As stipulated in PL 94-142, children with handicaps have the right to receive a "free, appropriate public education in the least restrictive environment" (Federal Register, 1977, p. 42488). The least restrictive educational placement for students with physical impairments (PI) has been identified as classrooms with nonhandicapped (NH) peers (Walker, 1984). Although some conditions such as cerebral palsy or myelomeningocele have been reported to present an increased risk of mental retardation, the majority of youth with PI have normal intelligence (Weitzman, 1984) or have cognitive profiles indicative of a presence of learning disabilities (Simeonsson, 1986; Williamson, 1987). Under-achievement has been a problem for some chronically ill children, but the academic achievement of other students with PI in regular classes has surpassed their achievement in segregated

settings (Carr, Halliwell, & Pearson, 1983; Center & Ward, 1984) and equaled or exceeded the achievement of NH students (Gregory, Shanahan, & Walberg, 1987a, 1987b). Ultimately, unless the student's physical well being is in jeopardy, learning needs, not the presence of a physical impairment or the use of orthoses and specialized medical equipment, should be used to determine optimal educational placement (Sirvis, 1988). Appropriate related services (Dykes & Venn, 1983) and comprehensive programs (Morgan, 1984) have been used to enhance the probability of students' success in regular classrooms.

The foremost goal of educational programs for students with PI has been to equip them with the physical and social adaptations (Sirvis, 1978) as well as communication necessary for successful adult lives in which the individual is "independent, productive, and integrated in the community" (Bellamy, Wilcox, Rose, & McDonnell, 1985, p. 126). In addition to academic performance, the efficacy of service delivery has been evaluated using outcome measures such as self-esteem, competency and autonomy, mobility and independence, activity level, social role performance, and communication skills (Brunswick, 1985). The interdependent relationship among these areas has presented an additional challenge to professionals attempting to maximize the opportunity for youth with PI to become successful adults (Mulkey & Brechin, 1988; Nelson, Fischer, & Rubenstein, 1985).

The self-concepts of students with PI have been related to the meaningfulness of activities in which they engage (Margalit & Cassel-Seidenman, 1987) and the degree of independence and self-efficacy that they experience (Palmer, Stieglitz, Lombardi, & Henfield, 1982). In turn, students' motivational orientations have affected self-efficacy; self-efficacy has influenced choice of activities (Schunk, 1985); and choice of activities has affected the level of independence achieved (Palmer et al., 1982). A cyclic pattern has been established that has the potential to enhance or hinder students' acquisition of life skills.

The social experiences of adolescents with PI have differed from those of their NH peers in terms of quantity and quality (Brown & Gordon, 1987; McAnarney, 1985; Tin & Teasdale, 1985). Differences in the communication patterns of NH individuals and students with PI have been reported. Conversational adjustments have been made by NH individuals based on their perceptions of the person with PI (Hackney, 1984; Thompson, 1981, 1983). These adjustments have indicated a relationship that is unequal in status (Donaldson, 1980) or have reinforced learned helplessness in the student with PI (Wiseman, Emry, Morgan, & Messamer, 1986). Perceptions about the listener have also affected the conversational patterns displayed by individuals with PI. Differences in interpersonal communication behaviors of individuals with PI, including nonverbal behaviors, have been affected by the presence or absence of a physical impairment in

the listener (Comer & Piliavin, 1972). Moreover, deficiencies in listener adaptation skills and low communicative frequency scores have been characteristic of mainstreamed students with PI in comparison to NH peers (Thompson, 1981, 1983).

Alterations in communication patterns that are negatively associated with the presence of a physical impairment are likely to influence the development of positive self-concepts, independence, and socialization of youth with PI (Wiseman et al., 1986). Aspects of physical impairments that have been associated with altered communication patterns include structural anomalies, sensory deficits, movement and coordination irregularities, mobility constraints, stamina limitations, and abnormal oramotor patterns (DeLoach & Greer, 1981; Richardson, 1976). Adolescents with PI may require explicit training in skills related to independence (Coupey & Cohen, 1984; Levenson & Cooper, 1984; Morgan, 1984; Turnbull & Turnbull, 1985), socialization (Margalit & Cassel-Seidenman, 1987), and communication (Coker & Coker, 1985; DeLoach & Greer, 1981).

In conclusion, educational programming for students with PI, in addition to traditional academics, must address a wide variety of physical, health, cognitive, speech, sensory, motivational, and psychosocial needs across all domains that are crucial to achieving autonomy as adults. The patterns of communication between individuals with PI and NH persons potentially impact all areas related to independent functioning. Placement in integrated

settings represents one aspect of programming that approximates the norms and conditions of everyday life experienced by NH individuals. Mainstream placements alone do not ensure that adolescents with PI will acquire the requisite skills to become independent, productive, and autonomous adults (Morgan, 1984); however, mainstream placement is realistic and preferable if the appropriate related services are provided (Walker, 1984) and if educational objectives focus on the student with PI achieving independence (Morgan, 1984).

Statement of the Problem

Professionals from education and health science disciplines have worked together to design and implement therapeutic and educational programs to facilitate the progress of students with PI in regular and special education settings (Hall & Porter, 1983). Interventions have focused on the students with PI or on individuals in the students' environment such as family members or classmates. Often interventions have been effective in addressing the demands of the immediate circumstances, but have been limited in scope because unforseen or novel situations were not always anticipated. The issue of training for generalization and transfer of skills across situations has not been addressed in numerous interventions.

The challenge in providing optimal educational programming for students with PI has been to design interventions which will meet their immediate needs while simultaneously providing for the

structure needed for the students to apply the skill in future events. Within a life span perspective, interventions are needed that (a) address the unique characteristics, strengths, and limitations of individual students with PI across settings; (b) enhance interactions with NH individuals; (c) incorporate motivational principles; and (d) promote independence and autonomy. Therefore, the problem addressed in this study was that of designing and using appropriate techniques that involve adolescents with PI in the process of obtaining the skills necessary for them to eventually reach their potential for independent functioning and autonomy across a variety of environments and situational demands.

Purposes of the Study

The primary purposes of this study were twofold. First, the intent was to develop an individualized, nonverbal communication training procedure for adolescents with PI that incorporates motivational theory and metacognitive principles. Next, the effectiveness of the procedure was determined by evaluating the nonverbal communication behaviors displayed by students with PI during training sessions and educational conferences. Of secondary interest was the satisfaction of the subjects as well as the students' teachers with the students' nonverbal communication behaviors during an educational conference.

Rationale of the Study

Difficulties associated with self-esteem, independence, socialization, and communication are characteristic of adolescents with PI. These areas of functioning often have been approached from a fragmented perspective in which problems within each were addressed separately. A more comprehensive approach is to identify behavior components that concurrently span several areas of functioning (Guess & Helmstetter, 1986; Sailor & Guess, 1983; Orelove & Sobsey, 1987) and to use procedures in which the process as well as the content contributes to goal attainment. Nonverbal communication skills represent one group of behaviors that may be integrated into the students' behavioral repertoire to enhance competence in communication interactions across several domains. Instructional procedures based on motivational and metacognitive principles not only facilitate the remediation of identified skill deficits but provide a strategy for students to become self-reliant in approaching future situations across a variety of settings.

Individuals with PI have been characterized as apprehensive communicators who avoid social situations and communication interactions (Coker & Coker, 1985). Several variables may be responsible for this situation. First, difficulties in communicating with others are reinforced in individuals with PI both by low self-esteem and diminished self-efficacy (Coker & Coker, 1985). Second, movement and coordination irregularities

that are associated with the impairment may preclude the acquisition or use of socially expected nonverbal behaviors (DeLoach & Greer, 1981; Wiseman et al., 1986). Finally, mutual misperceptions between NH individuals and individuals with PI regarding communication intent may perpetuate dysfunctional patterns of communication (Braithwaite, Emry, & Wiseman, 1984; Coker & Coker, 1985; Wiseman et al., 1986).

Behaviors related to nonverbal communication contribute over half of the total information transmitted in a communicative exchange (Coker & Coker, 1985; Fast, 1970). Nonverbal communication behaviors (NCBs) include facial expressions, eye behavior, posture, and body movements, as well as physical appearance, touch and proxemics (Coker & Coker, 1985; DeLoach & Greer, 1981). The messages that are sent through NCBs affect the way that the message recipient views the sender. As the result of their NCBs, individuals may be viewed as either interested or disinterested, responsive or unresponsive, approachable or unapproachable (Fast, 1970), competent or incompetent (Mulkey & Brechin, 1988), confident or unconfident, worthy or unworthy, helpless or capable (Braithwaite et al., 1984; DeLoach & Greer, 1981; Wiseman et al., 1986). The importance of NCBs in socialization (Wiseman et al., 1986; Fast, 1970) and overall functioning provides a rationale for training individuals with PI in communication competencies that include NCBs (Coker & Coker, 1985).

Although some training of conversational behaviors has occurred involving individuals with PI (Coker & Coker, 1985), no specific programs have been reported to date that address training to enhance NCBs. Through the use of NCBs, adolescents with PI may facilitate self-advocacy processes that enhance independence and autonomy. Advocacy roles are included in measures of independent living for adolescents with PI (Brunswick, 1985; Harnisch, Fisher, & Carroll, 1988). Self-advocacy skills are needed so that students with PI may become active managers of their life events. Self-advocacy skills can be used for educational planning, overcoming barriers to optimal school experiences, and acquiring transition services and skills.

Provisions for student participation in developing their Individualized Education Program (IEP) are present in federal guidelines for special education services (Federal Register, 1977). Student contributions to the IEP process have been advocated as a valuable source of information (Abeson & Weintraub, 1977) as well as an important means of facilitating student growth and maturity (Gillespie, 1979; Gillespie & Turnbull, 1983). The student's ability to communicate preferences, verbally or nonverbally, has been recognized as an important consideration in student participation (Bos & Van Reusen cited in Van Reusen, Bos, Schumaker, & Deshler, 1987; Gillespie & Turnbull, 1983; Van Reusen, 1985). Self-advocacy and effective communication, including appropriate NCBs, with teachers and peers represent

means to improve school experiences for adolescents with PI. Presently training procedures designed for this purpose are not available.

Theorists from motivation (Adelman, 1978; Deci, 1975; Deci & Ryan, 1985; Wittrock, 1986) and metacognition (Wittrock, 1986) perspectives have addressed principles thought to be positively associated with children's learning and achievement. Principles from motivation and metacognition theories have been included in techniques, referred to as learning strategies, that a learner uses during the learning process (Weinstein & Mayer, 1986). Deshler and Schumaker (1986) have emphasized the outcomes of learning strategies, stressing that "learning strategies are techniques, principles, or rules that enable a student to learn, to solve problems, and to complete tasks independently" (p. 583) across "situations and settings over time" (p. 584). Therefore, using a learning strategy format to train students with PI to improve their NCBs in educational conferences may be an avenue to increasing their situational performance, as well as increasing the likelihood of transferring the learned behaviors to new situations, thereby promoting individual autonomy.

In view of research on the importance of NCBs and the dysfunctional communication patterns between individuals with PI and NH individuals, it can be concluded that youth with PI should benefit from instruction in NCBs. Training NCBs should enhance their communication skills and interactions. Moreover, a learning

strategy format (Deshler & Schumaker, 1986) for training in which motivation and metacognitive principles are incorporated should encourage the development of goal oriented behaviors that ultimately lead to goal attainment and autonomy for students with PI. Such a training procedure is structured yet flexible enough to accommodate the diverse characteristics that influence the individual communication patterns of adolescents with PI.

Definitions

Ataxia is a "loss of the power of muscle coordination" (Umbreit, 1983, p. 286). Ataxia results from damage to the cerebellum. Balance and equilibrium are affected.

Athetosis is "a condition in which there is a constant succession of slow, writhing, involuntary movements of flexion, extension, pronation, and supination of the fingers and hands, and sometimes of the toes and feet" (Stedman's, 1972, p. 123).

Bell's palsy refers to a partial paralysis of the face (Stedman's, 1972).

Cerebral palsy (CP) is a nonprogressive disorder of movement and posture which is caused by trauma to or malfunction of the brain and occurs during the developmental period (Bleck & Nagel, 1982).

Cerebritis is "nonlocalized inflammation of the brain without [abscess]" (Stedman's 1972, p. 230).

Concurrent generalization is generalization of a skill while the student is still receiving instruction for skill acquisition (Ellis, Lenz, & Sabornie, 1987a, 1987b).

Hemiparesis is a "slight paralysis affecting one side [of the body] only" (Stedman's 1972, p. 562).

Generalization is "the extent to which a student uses and effectively adapts a skill outside the setting in which it was learned" (Lenz, Alley, Schumaker, & Deshler cited in Ellis, Lenz, & Sabornie, 1987a, p. 7). More specifically, generalization refers to "the occurrence of relevant behavior under different nontraining conditions (ie., across subjects, settings, people, behaviors, and/or time) without the scheduling of the same events in those conditions as had been scheduled in the training conditions" (Stokes & Baer, 1977, p. 350).

Juvenile rheumatoid arthritis (JRA) is "characterized by chronic or chronically recurrent inflammation of the joints and to a lesser extent, other tissues of the body" (Hanson, 1983, p. 240). Extensive inflammation manifests in fatigue which limits ordinary activities. Profuse sweating, intermittent mild fever, and anemia may also be exhibited (Stedman's, 1972).

Least restrictive environment means that students with handicaps should receive educational services in regular classrooms with regular students to the maximum extent possible. When this is not possible, the delivery of services should vary to the least possible degree required to meet the child's unique needs (Morsink, 1984).

Mainstream refers to the full or part-time placement of handicapped children in regular education classes with nonhandicapped peers (Eichstaedt & Kalakian, 1987). These classes are taught by regular classroom teachers (Wallace & McLoughlin, 1979).

Myelomeningocele "is a congenital defect in [the] walls of the spinal canal caused by lack of union between the laminae of the vertebrae" (Thomas, 1985, p. 1599) "with a portion of [the] cord and [its] membranes protruding" (Thomas, 1985, p. 1085). The spinal cord is abnormal below, and usually several spinal segments above, the level of the sac causing paralysis or lower extremity impairment. Bowel and bladder control are affected. The child may have hydrocephalus and/or specific difficulties in learning. Hyperverbal behavior or "the cocktail party syndrome" is often exhibited (Williamson, 1987).

Nonhandicapped (NH) refers to any individual who demonstrates cognitive, communicative, motor, sensory, and social behaviors at appropriate levels for peers of the same age.

Nonverbal communication behaviors (NCBs) include: "(1) body motions or kinesics . . ., (2) physical characteristics, (3) touching behavior, (4) paralanguage (vocal qualities such as tone and pitch), (5) proxemics (the distance between two persons interacting), (6) artifacts (articles adoring one's person), and (7) environment." (Knapp, 1972, pp. 20-21)

The nonverbal behaviors to be used in this study are sitting-up-straight, leaning forward, positioning of arms and hands, eye

contact, smiling, and head nodding. The operational definitions of these specific nonverbal behaviors are included in Chapter III, Methods.

Nystagmus refers to a "rhythmical oscillation of the eye balls, either horizontal, rotary, or vertical" (Stedman's, 1972, p. 865).

Ocular dysmetria is a lack of harmonious action between the eye muscles "in which the subject is unable to arrest a muscular movement at the desired point" (Stedman's, 1972, p. 386).

Orthopedically impaired refers to a severe impairment in structure, function or mobility which adversely affects a child's educational performance. The term includes impairments caused by congenital anomaly (e.g., open spine, clubfoot, absence of some member, etc.), impairments caused by disease, (e.g., poliomyelitis, arthritis, muscular dystrophy, bone tuberculosis, etc.), and impairments from other causes (e.g., cerebral palsy, amputation, closed head trauma, and fractures or burns which cause contractures) (Federal Register, 1977).

Other health impaired means limited strength, vitality, stamina or alertness due to chronic or acute health problems such as a heart condition, tuberculosis, rheumatic fever, nephritis, asthma, sickle cell anemia, hemophilia, epilepsy, lead poisoning, leukemia, or diabetes, which adversely affect a child's educational performance (Federal Register, 1977). The child may require advanced life support or be "technology dependent" (Sirvis, 1988).

Physical impairments (PI) refer to the conditions included in the Federal Register 1977 definitions of "orthopedically impaired" and "other health impaired" as well as the Florida Statutes and State Board of Education Rules (SBER) (1988). Furthermore, West, Williams, White, Cappellari, Hill, and Dykes (1988) noted that

> the physically impaired child often requires special handling and positioning procedures as well as communication and/or mobility-enhancing equipment in order to participate in learning, vocational and social activities within the school. Learning is affected by the degree to which the environment permits integration of the child with nonhandicapped peers into all activities and spaces. Students may require instruction in activities of daily living (feeding, dressing, etc.), movement, health maintenance and/or communication. Many students with physical impairments also have specific needs for intervention related to learning, language disorders, behavioral dysfunction or sensory deficit. The child in a PI program tests in the average to gifted range of general intellectual functioning. (p. 6)

Quadriparesis is a slight paralysis affecting all four limbs of the body (Stedman's, 1972).

Scoliosis is "lateral curvature of the spine" (Stedman's, 1972, p. 1128).

Spasticity refers to "a state of increased muscular tone with exaggeration of the tendon reflexes" (Stedman's, 1972, p. 1167).

Strabismus refers to "a constant lack of parallelism of the visual axes of the eyes" (Stedman's, 1972, p. 1201).

Subsequent generalization is "applying the skill to various contexts, situations, and settings" (Ellis, Lenz, & Sabornie, 1987a, p. 9) "after the student has mastered the [skill] but is not habitually using or adapting the [skill] in other environments" (Ellis, Lenz, & Sabornie, 1987b, p. 6)

Thoracolumbar refers to the "thoracic and lumbar portions of the spine" (Stedman's, 1972 p. 1293).

Delimitations of the Study

The scope and focus of this study were limited by geographic region, school variables, and student characteristics. The study took place in Gainesville, Florida, which is located in Alachua County. Students with PI from several counties attended the regular middle school involved in the study. There was a program for students with PI based at the school. Nonhandicapped students also attended the school but were not part of the investigation. All subjects included in the study were eligible for special education services as set forth by state guidelines. Additionally, the subjects in the study attended both mainstream classes and classes designed for students with PI.

Limitations of the Study

This study was limited by factors which may affect the interpretation of the data obtained. Considerations were made for the following limitations.

Due to the use of a video camera during data collection, the subjects' behaviors may not have been representative of those that would occur in natural situations. To minimize the effects of this limitation, the subjects were videotaped the week prior to initial data collection during regular classroom activities.

Although nonrandom selection and small numbers of subjects sometimes limit the external validity of research findings, the

procedures used in this study adhered to those recommended by Tawney and Gast (1984) for single subject experimental research. The multiple baseline design across behaviors was used to provide evidence of treatment effectiveness by replicating effects within the same subject at different points in time.

Finally, the generalizability of the study findings may be limited by the unique physical and learning characteristics of the subjects. The findings may not apply to other age groups or classifications of handicapped or nonhandicapped students. Societal expectations for young and elementary age children may not be the same as for older individuals in relation to nonverbal interactive skills.

Summary

Developing autonomy has been a primary concern for adolescents with PI. Although a physical impairment may directly affect movement, coordination, mobility, stamina, and communication patterns, numerous skills associated with achieving independence and autonomy have been attained by individuals with PI. The presence of a physical impairment has not been the only barrier to overcoming difficulties in life management areas. Nonhandicapped persons may have inaccurate perceptions about the performance potential of individuals with PI. These diminished expectancies often have resulted in dysfunctional interaction patterns between NH individuals and persons with PI. Nonverbal communication behaviors are one aspect of interactions in which the differential

responses between individuals with PI and NH individuals have been evident.

Interventions are needed that will afford the training for adolescents with PI to develop the NCBs necessary for them to communicate and interact effectively with persons in their environment. Training procedures that incorporate motivational principles and actively involve adolescents with PI in the instructional process will increase their potential for independent functioning and autonomy across a variety of environments and situational demands. Presently, the NCB training of students with PI and the potential impact of their unique characteristics on skill acquisition have not been reported. The intent of the present investigation was to contribute to the knowledge base of providing effective programming that fosters independence in students with PI.

The following chapters contain information relevant to the present study. Pertinent literature has been reviewed in Chapter II. Research methodology and procedures have been presented in Chapter III. Chapter IV contains the research results. Implications of research findings have been discussed in Chapter V.

CHAPTER II
REVIEW OF LITERATURE

In this chapter, literature has been reviewed which supports the need (a) to explicitly train adolescents with physical impairments (PI) to enhance nonverbal communication behaviors and (b) to incorporate principles from motivation and metacognitive theories in the training program. First, an overview of the fundamental precepts from theories of perceived personal control and motivation has been presented. The primary theoretical distinctions among social learning theory, attribution theory, and intrinsic motivation theories have been examined as related to locus of control. Basic principles of metacognitive strategies have been presented next.

Additionally, characteristics of individuals with PI that have been relevant to their development of independence and autonomy have been reviewed from the literature. Motivation and locus of control orientations of individuals with PI have been discussed. The reported attitudes of nonhandicapped (NH) individuals towards persons with PI and the self-concept of individuals with PI have been presented. Both sets of attitudes have had an impact on (a) the expectancies that NH individuals have for the behavior of persons with PI and (b) the self-efficacy of individuals with PI.

Therefore, the altered interaction patterns that have been reported to occur as the result of negative attitudes have been reviewed. Finally, the communication patterns between NH persons and individuals with PI have been examined. Nonverbal as well as verbal behaviors have been identified as crucial to the communication process. The need to develop independence and autonomy in the individual who is physically impaired has been a common element throughout.

Theoretical Orientations

Motivation and Perceived Personal Control

Perceived personal control has been reported to affect children's self-esteem (Seligman & Miller, 1979), motivation (Stipek & Weisz, 1981), persistence, self-efficacy (Bandura, 1977; Wilson, 1979), task performance (Ryckman, 1979), and academic achievement (Stipek & Weisz, 1981; Wilson, 1979). Although still not fully understood, the role of personal control in children's development has evolved from insular origins in which the term "control" was used simplistically to describe disparate ideas. A clear understanding and delineation of the components of perceived personal control are necessary to alleviate ambiguity in the measurement, interpretation, and application of research findings. Task selection (Perlmuter & Monty, 1977), task contingency, locus, stability, specificity (Deci, 1975; Lefcourt, 1976; Perlmuter & Monty, 1977; Stipek & Weisz, 1981), and more recently, the

informational nature of events (Deci & Ryan, 1985) have been determined to be relevant to perceptions of personal control.

Locus of control has been defined generally as "a circumscribed self-appraisal pertaining to the degree to which individuals view themselves as having some causal role in determining specified events" (Lefcourt, 1976, p. 141). Stipek and Weisz (1981) identified three theoretical perspectives of perceived personal control: social learning theory (SLT), attribution theory (AT), and intrinsic motivation theories (IMTs). All three theories pertain to an individual's perceptions of who controls events but differ on their emphasis of the event context versus the event outcome. Event context refers to the selection of tasks or choice (Lefcourt, 1976; Perlmuter & Monty, 1977; Stipek & Weisz, 1981). Event outcome pertains to the perceived contingency in operation (Lefcourt, 1976; Stipek & Weisz, 1981).

Social learning theory. The focus in SLT (Rotter, 1966) has been on the subject's belief about the contingency of outcomes in relation to the subject's own behavior (Lefcourt, 1976; Stipek & Weisz, 1981). The belief that an event is contingent on factors such as ability or effort that are within the subject's behavioral repertoire have been labeled internal control. Conversely, external control has been referred to as the perception that an event is contingent on factors beyond the subject's control, such as luck or task difficulty (Lefcourt, 1976; Ryckman, 1979; Stipek & Weisz, 1981).

Attribution theory. Similar to SLT, the focus in AT has been on the contingency aspect of outcomes in relation to the subject's own behavior or characteristics (Stipek & Weisz, 1981). However, Weiner (1979) labeled the perception of outcome contingency as locus of causality and differentiated it from control. Whereas locus of causality may be internal or external, internal causes may be (a) controllable factors such as effort or (b) uncontrollable factors such as ability. External causes have been similarly designated as controllable or uncontrollable. Hence, the "control dimension concerns the subject's perception of his or her ability to alter the factor that causes the outcome" (Stipek & Weisz, 1981, p. 129). Weiner has distinguished further between causal factors that are stable, intelligence or task difficulty, and unstable, mood or effort (Stipek & Weisz, 1981).

Intrinsic motivation theories. Basic to IMTs has been the notion that individuals have an intrinsic need to interact effectively with their environment and that task mastery results in personal satisfaction that in turn reinforces competent behavior (Stipek & Weisz, 1981). Deci (1975) defined intrinsically motivated behaviors as "behaviors which a person engages in to feel competent and self-determining" (p. 61). The emphasis in IMTs has been on the event context, the control element referring to choice or self-determination (Deci & Ryan, 1985). Event outcome is important but only in that a consequence of becoming self-determining is taking more responsibility for

outcomes (Stipek & Weisz, 1981). As more responsibility for outcomes is accepted, feelings of personal causation are enhanced (de Charms, 1979). Perceptions of "learned helplessness" occur when individuals feel they cannot overcome failure (Dweck, 1975; Wittrock, 1986). Thus, outcomes are important for their feedback relationship to perceptions of self-determination but are not associated with the contingency dimension found within SLT and AT in which internal or external factors are viewed as responsible for outcomes (Stipek & Weisz, 1981).

Deci and Ryan (1985) elaborated on the significance of initiating or regulating events. Three types of events were described on the basis of whether they are perceived (a) to support autonomy versus control behavior and (b) to be effectance-enhancing versus effectance-diminishing. Informational events support autonomy and provide effectance-enhancing feedback. Controlling events exert pressure toward particular outcomes. Amotivating events act to prevent complete attainment of desired outcomes. Furthermore, Deci and Ryan proposed a locus of causality based on the informational or controlling nature of events regardless of whether the event occurs inside or outside of the person. An internal perceived locus of causality has been associated with informational events, whereas an external locus of causality has been associated with controlling events.

Additionally, Deci and Ryan (1985) presented a continuum of causality orientations labeled autonomy, control, or impersonal

that have been purported to be present within each person. Whereas autonomy and control orientations are associated with informational and controlling events, respectively, the impersonal orientation is associated with amotivating events.

> The impersonal orientation is based in a sense of one's being incompetent to deal with life's challenges . . . [It] involves the beliefs that behavior and outcomes are independent and that forces are uncontrollable, and it results in the experience of incompetence. (Deci & Ryan, 1985, p. 159)

The impersonal orientation resembles the concept of perceived contingency of outcomes in SLT and AT but may be most comparable to the flow of events that lead to symptoms of helplessness (Seligman & Miller, 1979). Accordingly, objective noncontingency is reinforced by (a) perceptions of present and past noncontingency, (b) attributions for present or past noncontingency, and (c) expectations of future noncontingency.

Different aspects of personal control are present in SLT, AT, and IMTs. Although the precise relationship between choice and contingency of outcomes has not been established, the components within a construct of perceived personal control may be correlated. Lefcourt (1976) suggested that a continuum of control ranges from internal to external. He further characterized the perception of control as a process which includes the perceived contingency of events and one's perceived role in goal selection. Stipek and Weisz (1981) recommended that aspects of all theories be assimilated for a better understanding of the effects of perceived personal control on child development. Accordingly,

intrinsic motivation theorists have begun to examine the nature and consequences of initiating or regulatory events in relation to self-determination.

Metacognition and Learning Strategies

The developmental pattern of metacognitive theory has resembled that of motivation theories in that ambiguity of terminology has been characteristic of both. General terminology has been used to represent broad concepts that have subtle differences (Hagen, Barclay, & Newman, 1982). The differences in the meaning of the terms seem to arise when theorists attempt to identify the various components of the broader construct of metacognition. Consequently, the construct of metacognition has had a generally accepted definition that has been explained in varying ways. In order to understand the theory of metacognition it is necessary to examine a general definition of the concept as well as the various perspectives concerning (a) the underlying components of metacognition and (b) the implications for student instruction.

Definition of metacognition. Metacognition has been broadly defined as "knowledge that learners have about various aspects of the learning situation" (Reynolds & Wade, 1986, p. 308) and cognitive processes. Moreover, metacognition has been differentiated from cognition. Cognition refers to those processes that are used by individuals in the acquisition of knowledge such as (a) attention, memory, and comprehension

(Reynolds & Wade, 1986) or (b) the individual's actual knowledge, goals, experiences and strategies (Fry & Lupart, 1987). Metacognition has been defined more specifically as the learner's conscious knowledge about and control over their cognitive processes (Flavell, 1979; Fry & Lupart, 1987; Hagen et al., 1982; Meichenbaum & Asarnow, 1979; Reynolds & Wade, 1986; Reynolds, Wade, Trathen, & Lapan, 1989; Tennyson & Rasch, 1988; Wittrock, 1986). Flavell (1979) summarized one perspective of the difference between cognition and metacognition in terms of the purpose of the respective strategies. "Cognitive strategies are invoked to make cognitive progress, metacognitive strategies to monitor it" (Flavell, 1979, p. 909).

Two concepts have been basic to most definitions of metacognition: (a) the learner's consciousness of the cognitive processes and (b) the difference between knowledge of and control over cognitive processes (Fry & Lupart, 1987; Reynolds & Wade, 1986). Knowledge of cognitive processes refers to the learner's "sensitivity" to situations requiring specific cognitive activities (Fry & Lupart, 1987; Hagen et al., 1982) or the "degree of awareness of the skills, strategies, and resources needed to perform a task effectively" (Reynolds & Wade, 1986, p. 308). Control over cognitive processes involves the procedural knowledge of tactics or self-regulatory mechanisms in which learners engage to insure success in the situation (Flavell, 1979; Fry & Lupart, 1987; Hagen et al., 1982; Mosenthal, 1982; Reynolds & Wade, 1986).

Subsuming the difference between knowledge and control of cognitive processes, theorists have attempted to further explicate metacognition by presenting various components of the metacognitive process.

Components of metacognition. Flavell (1979) presented a global model of metacognition that incorporates the relationships between metacognitive knowledge, metacognitive experiences, goals (or tasks), and actions (or strategies) (Fry & Lupart, 1987; Hagen et al., 1982). Goals and actions refer to the cognitive objectives and the behaviors needed to achieve the objectives respectively. Goals and actions are interrelated with metacognitive knowledge and experiences. Metacognitive knowledge includes knowledge about the person, task, and strategy variables that affect cognitive endeavors (Hagen et al., 1982). Interindividual and intraindividual learning differences as well as universal learning principles are included in person variables. The task category encompasses the information available during a cognitive endeavor including situation variations and specific task demands or goals (Flavell, 1979). Strategy variables refer to stored knowledge about specific tactics that can be used to interpret and understand a learning activity (Fry & Lupart, 1987). Metacognitive experience represents an affective component that consists of the learner's awareness of personal feelings about a situation (Flavell, 1979; Fry & Lupart, 1987).

Investigations of metacognitive processes have included studies about the presence, nature, and development of strategies in children for approaching cognitive enterprises (Meichenbaum & Asarnow, 1979; Mischel & Mischel, 1983). Wong (1986) stated that metacognition enables the learner to "use suitable strategies to deal effectively with . . . task demands" (p. 12). Flavell's strategy variables (1979) have been further developed into a construct referred to as "metamemory about strategies" (Pressley, Burkowski, & O'Sullivan cited in Reynolds & Wade, 1986). Metamemory about strategies includes six components relevant to the learner's factual and application knowledge about strategies: (a) general strategy knowledge, (b) specific strategy knowledge, (c) learner strategies, (d) relational memory acquisition procedures, (e) relational memory strategy knowledge, and (f) metamemory acquisition procedures (Reynolds & Wade, 1986). The interrelationship between knowledge about and implementation of strategies have been fundamental to many explanations of metacognitive processes (Hagen et al., 1982).

Other researchers have emphasized the dynamic aspects of metacognition (Hagen et al., 1982). These researchers have investigated the executive control aspects of metacognition as related to "(a) the selection of task-appropriate problem-solving strategies, (b) implementation and use of selected routines for problems of a similar type, and (c) on-line adjustments and revisions of strategic behaviors to accommodate changes in task

demands" (Hagen et al., 1982, p. 20). Selection, implementation, and adjustments of strategies are coordinated by self-monitoring processes.

Metacognitive strategies. Whereas metacognition has been defined as the awareness and control of cognitive processes, strategies have been described as the procedures that the learner uses to facilitate performance (Pressley, Goodchild, Fleet, Zajchowski, & Evans, 1987). Strategies have been categorized based on (a) the domain specificity of the strategy (Pressley et al., 1987), (b) the learner's behavior during strategy use (Weinstein & Mayer, 1986), and (c) the goals to be accomplished using the strategy as distinguished by three areas of research (deBettencourt, 1987).

Pressley et al. (1987) referred to task-limited and across-domain strategies. Task-limited strategies are used for specific purposes in specific domains. An example of a task-limited strategy is a learner's use of a first letter mnemonic as a specific memory device without knowing a rule to generalize this technique to other situations. Across-domain strategies include the subcategories of goal-limited and general strategies. Both of these across-domain strategies have the potential to be used in various content areas. However goal-limited strategies are used for a specific purpose (i.e., comprehension of reading material) across a limited number of content areas. General strategies, such as checking for correct performance, can be used across most

domains. Although Pressley et al. (1987) have designated strategies as either task-limited or across-domain, the two categories are not mutually exclusive. Task-limited strategies may become across-domain strategies if the learner generalizes the strategy concept to new applications.

Weinstein and Mayer (1986) identified eight categories of learning strategies. The categories are descriptive of learner behaviors, the methods designed to influence learning outcomes and/or performance, and the level or complexity of the strategy. The categories include: basic and complex rehearsal strategies, basic and complex elaboration strategies, basic and complex organizational strategies, affective and motivational strategies, and comprehension monitoring strategies.

DeBettencourt (1987) identified strategy training models based on three research perspectives and goals for student learning. Lloyd's Academic Strategy Training for specific academic problems was associated with memory research. Research in selective attention was related to Torgeson's Strategy Training in which student's are taught to apply general strategies that are already in their repertoire. Consistent with research on metacognition, independent learning skills (Tennyson & Rasch, 1988) are the goal of Deshler's Learning Strategies Model at the University of Kansas Institute of Research on Learning Disabilities (KU-IRLD) (deBettencourt, 1987). The generalizability and maintenance of metacognitive strategies have been recognized as the most

important criteria for evaluating the success of strategy training programs (Reynolds & Wade, 1986).

Generalization. In order for a skill or behavior to be used outside of the specific contexts and contingencies of a training situation, generalization must occur (Meichenbaum & Asarnow, 1979; Stokes & Baer, 1977). Comprehensively defined, generalization is "the occurrence of relevant behavior under different nontraining conditions (ie., across subjects, settings, people, behaviors, and/or time) without the scheduling of the same events in those conditions as had been scheduled in the training conditions" (Stokes & Baer, 1977, p. 350). Stimulus generalization, response generalization, and adaptation are subtypes within the concept of generalization (Ellis, Lenz, Sabornie, 1987a). Stimulus generalization occurs when a learned skill is exhibited in different conditions than were present during skill instruction. Although the stimuli change, the response remains the same. "Response generalization occurs when the training of one skill causes a change in another untrained skill" (Ellis et al., 1987a, p. 8). Adaptation occurs as a function of interrelated stimulus and response changes. "As the stimuli differ more markedly from those used in training, adaptation of the skill is required for making the response" (Ellis et al., 1987a, p. 8).

Stokes and Baer (1977) advocated active programming for generalization. Several categories of instruction that promoted generalization were presented including training sufficient

exemplars, mediated generalization, and systematic use of instruction. In order to train sufficient exemplars, instruction occurs across a number of setting conditions and/or persons. Stokes and Baer noted that often training in just two conditions increased the likelihood of generalization to a third condition. In mediated generalization the learner is actively involved in the generalization process through the use of a variety of self-management procedures. Systematic use of instruction to facilitate generalization involves informing the subject about the possibility of generalization and then asking for it.

The categories of instruction for generalization are not mutually exclusive and often elements from several categories have been evident in generalization programming. Deshler and his colleagues at the KU-IRLD have incorporated several techniques for encouraging the generalization of learning strategies across settings and materials (Deshler & Schumaker, 1986, 1988; Schumaker, Deshler, Alley, & Warner, 1983; Schumaker & Ellis, 1982). However, the primary precept of the KU-IRLD generalization programming has been the systematic use of instruction to facilitate generalization. Ellis et al. (1987a, 1987b) proposed a model in which generalization instruction occurred along a continuum and was infused into skill instruction.

Four levels of generalization instruction were identified by Ellis et al. (1987a, 1987b): antecedent, concurrent, subsequent, and independent generalization. Antecedent generalization occurs

prior to direct instruction in the new skill. Instructional design features and student attitudes are addressed in antecedent generalization. The intent is to create conditions conducive to strategy generalization from the outset of training. Instructional design features include mnemonic devices to facilitate memory and strategies that can be used across situations. Student comprehension of the purpose of instruction and goal setting behaviors are fundamental to motivation to learn and generalize the new skill. Concurrent generalization training occurs while the student is still receiving instruction for skill acquisition. Effective instructional practices are included and skill mastery, as well as student motivation, are emphasized. Products from the targeted generalization setting (ie., the regular classroom versus remedial classroom) are reviewed regularly in order to provide feedback to the student and to reinforce the expectancy that the new strategy or skill will be generalized beyond the training conditions. Subsequent generalization training occurs after skill mastery in the training conditions. The emphasis is on applying the skill to various contexts, situations, and settings. Generalization maintenance activities may be implemented at this level of instruction. Independent generalization is the fourth level of instruction in the model proposed by Ellis et al. (1987a, 1987b) and presumably occurs after subsequent generalization. Activities for independent generalization include self-management procedures

similar to those presented by Stokes and Baer (1977) for mediated generalization programming.

Necessary components of strategy instruction. The general purpose of metacognitive training programs has been to facilitate students' problem-solving behavior by providing them "with a variety of conscious strategies so that they can process information more efficiently under a variety of tasks and material conditions" (Mosenthal, 1982, p. 103). The use of learning strategies has been associated with improved student performance with regard to academic and interpersonal task demands for students with and without learning problems (Clark, Deshler, Schumaker, Alley, & Warner, 1984; Ellis, 1989; Ellis, Deshler, & Schumaker, 1989; Gagne', 1988; Schumaker, Deshler, Alley, Warner, & Denton, 1982; Van Reusen, 1985; Weinstein & Mayer, 1986; Wittrock, 1986). Although the exact processes involved in metacognition have not been unequivocally determined (Reynolds & Wade, 1986), several correlates of students' acquisition and generalization of learning strategies have been identified (Fry & Lupart, 1987; Hagen et al., 1982; Meichenbaum & Asarnow, 1979; Pressley et al., 1987; Reynolds & Wade, 1986; Symons, Snyder, Cariglia-Bull, & Pressley, 1989).

The students' acquisition of metacognitive strategies have been facilitated by interactive and direct teaching techniques (Symons et al., 1989). These techniques include: (a) explicit explanations of the cognitive processes involved in the strategy;

(b) making the cognitive processes visible and observable through teacher modeling (Pressley et al., 1987; Reynolds & Wade, 1986); (c) reciprocal teaching that includes opportunities for overt and covert student rehearsal of the strategy; (d) providing performance feedback to the student; and (e) training the student to generate self-feedback about the effectiveness of the strategy (Meichenbaum & Asarnow, 1979; Pressley et al., 1987; Reynolds & Wade, 1986).

The type of strategy that is taught has been related to the generalizability of the strategy skill (Fry & Lupart, 1986; Reynolds & Wade, 1986). The potential to enhance student performance is greater with general skills that can be used across several domains. Task specific strategies provide fewer opportunities for the student to use the strategy and hence less impact on overall student performance. The maintenance and generalization of strategy use is also increased when instruction is in depth and lasts for prolonged periods of time (Meichenbaum & Asarnow, 1979; Symons et al., 1989). Superficial teaching of many strategies concurrently has not been reported to result in durable changes in metacognitive behaviors.

Symons et al. (1989) reported that knowledge and experience elements are crucial to students' metacognition about strategies. Students must know when and where to use a given strategy (Pressley et al., 1987; Symons et al., 1989). However, training across settings, conditions, and persons increases the likelihood

that the student will use the strategy across situations (Meichenbaum & Asarnow, 1979; Pressley et al., 1987; Symons et al., 1989). Another situational aspect that has been addressed as important to strategy training is the context of instruction (Deshler & Schumaker, 1988; Symons et al., 1989). Strategies have been found to be most relevant to current and future tasks when the students' actual curriculum materials were used in training.

Strategy Intervention Model (SIM). A model for teaching learning strategies to low achieving adolescents has been developed at the University of Kansas by Donald Deshler and his colleagues (Deshler & Schumaker, 1986, 1988; Schumaker, Deshler, Alley & Warner, 1983; Schumaker, Deshler, & Ellis, 1986; Pressley, Symons, Snyder, & Cariglia-Bull, 1989; Symons et al., 1989). The SIM was developed to address the demands and expectations encountered by adolescents in and out of school settings. These demands include academic, motivational, executive, and social aspects of student behaviors. Not only are students expected to accomplish specific academic requirements but to exhibit goal setting, independent problem solving, and appropriate interpersonal interaction behaviors as well. The instructional sequence used to teach the strategies incorporates effective teaching principles from the literature on metacognition and motivation theories (Pressley et al., 1989). Instruction in each learning strategy includes a description of the strategy, student goal setting for strategy mastery, reciprocal teaching techniques

and modeling, verbal rehearsal, extensive practice in controlled and advanced materials, feedback, student performance monitoring and data display, mastery learning, and generalization and maintenance activities.

Individuals with Physical Impairments

Motivation and Perceived Personal Control

Motivation or locus of control (LOC) orientations may be related to levels of independence and aspirations for adolescents with PI. Researchers have reported that an internal LOC and intrinsic motivation are positively associated with task performance and academic achievement (Brigham, 1979; Ryckman, 1979). However, research results about the LOC orientations of youth with PI have been ambiguous (see Table 1). Although conflicting results may be attributed to differences inherent to the studies, unequivocal relationships among variables have not been delineated.

Differences in the internality or externality reported for students with PI may have been due to the interstudy variability of the subjects's ages, type and severity of handicaps, educational placements, data gathering procedures, and program content. Students with PI in mainstream placements displayed greater external LOC orientations than PI students in segregated settings (Morgan, 1984; Palmer, Stieglitz, Lombardi, & Henfield, 1982) and NH students (Gregory, Shanahan, & Walberg, 1987b; Palmer et al., 1982).

Table 1

Locus of Control (LOC) and Motivation in Students with Physical Impairments

	Subjects		Instruments
Palmer, Steiglitz, Lombardi, & Henfield 1982	1. CP, MD, & MY SS n=143	2. PI MS n=50	1. The Nowicki Strickland LOC Scale for Children 2. Piers-Harris Children's Self-Concept Scale 3. Attitude component: Career Maturity Inventory
	* Grades: K-12 * NH: Norm values used		
Results: (Grades 7-12 only) 1. Internal LOC: SS<NH; MS<NH; SS>MS 2. Self-concept: SS>NH[a]; SS>MS[a]; MS= or >NH 3. Independence Gr 7-8: SS>MS; SS>NH; MS=NH Gr 9-12: SS=MS; SS<NH; MS<NH 4. Wheelchair(WC) vs. nonWC users: WC have greater decisiveness, self concept, and internal LOC.			
Gregory, Shanahan, & Walberg 1987a, 1987b	1. OH, MS Grade 10: n=397 Grade 12: n=353	2. NH Grade 10: n=29,633 Grade 12: n=25,789	National High School and Beyond Survey (early 1980's)
Results: 1. Locus of Control--Gr 10: OH=NH; Gr 12: OH>NH External LOC 2. Independence--Gr 10: OH=NH; Gr 12: not reported 3. Motivation and Work Orientation--Gr 10: OH<NH; Gr 12: OH<NH			

Table 1--Continued

Study	Subjects		Instruments
Morgan 1984	1. PI severe RS n=46	2. PI severe MS n=38	Millers Children's Locus of Evaluation and Control Scale
	* Ages: 8-12 yrs; Mean IQ 89.8		Hayku Picture Motivation Inventory
Results 1. Internal Locus of control RS>MS[a] 2. Incentive Orientation RS>MS[a]			
Center & Ward 1986	1. CP: MS n=85	2. NH: n=1391	1. The Nowicki-Strickland LOC scale for Children. 2.Preschool Primary Internal-External Control Scale.
	* Ages: 6-16 yrs	* Grades 1-10	
	* CP: 81% mild; 16.5% moderate		
Results: Locus of control (LOC) 1. no relatationship to academic/social success 2. NH=CP LOC: no relationship to academic nor social success			

Note. Symbols: a --significant at $p \leq .05$; > --greater than; < --less than; = --equal

Subjects: NH--nonhandicapped; PI--physical impairment; OH--orthopedic handicap CP--cerebral palsy; MD--muscular dystrophy; MY--myelomeningocele

Placements: RS--residential school; SS--separate school; MS--mainstream

Tenth grade mainstream students with orthopedic impairments (Gregory, Shanahan & Walberg, 1987a) and mainstream students with cerebral palsy in grades one through ten (Center & Ward, 1986) had LOC orientations similar to NH students. Rich, Linor, and Shalev (1984) reported that students' feelings about school varied according to the type of physical handicap present. It may be difficult to determine a generalized description of the LOC for students with PI across all handicapping conditions. Morgan (1984) noted that program emphases and family situations that varied across placement settings could contribute to subjects' differences in LOC.

Contradictory findings about the LOC of students with PI may have been due to assessment factors. Not only did the scales used to measure LOC vary (see Table 1) but Center and Ward (1986) noted that there were psychometric problems with the scales they used to measure LOC. Variable reliabilities in general and particularly low reliabilities for some subgroups of children (Stipek and Weisz, 1981) corroborate the implication of psychometric problems in some LOC measures.

Regional differences may be responsible for differential results obtained by researchers for students in different settings (Palmer et al., 1982). General differences due to urban and rural influences have been reported for some special populations (deBettencourt, Zigmond, & Thornton, 1989; Harnisch, Fisher, &

Carroll, 1988). LOC findings for an Australian sample were inconsistent with results found for American samples (Center & Ward, 1984). Regional effects on LOC assessments rather than educational placement differences may have been responsible for the LOC variations found by Palmer et al. (1982) between regular and separate school students. The mainstream sample was taken from a midwestern school and the segregated sample from a school in Albertson, New York. Geographic region as well as the psychometric properties of instruments may be an important consideration for LOC comparisons of students with PI.

Although the generalizability of LOC and motivation characteristics for all adolescents with PI has not been demonstrated, some students with PI seem to be at an increased risk for LOC orientations that have been negatively associated with independence and autonomy (Deci & Ryan, 1985; Schulz & Hanusa, 1979). Some adolescents with PI have experienced difficulties in acquiring independence. In a nationwide survey high school students with orthopedic handicaps reported independence equivalent to NH high school students (Gregory, Shanahan, & Walberg, 1987a, 1987b), Morgan (1984) reported that students with severe physical handicaps in institutionalized settings were more independent than their mainstreamed counterparts. The mean IQ was 89.8 for both groups of subjects. Students with severe sensory handicaps and/or profound mental

retardation were excluded from the study. The findings were attributed to differential program emphases. Educational goals in the more restrictive placements included achieving total independence as well as academic gains. Academics were emphasized in the mainstream programs and assistance was rendered by NH teachers and peers for physically oriented tasks. There was little emphasis on achieving independence in terms of opportunities to overcome physical limitations or to capitalize on abilities. Young adults with cerebral palsy rated training for independence as the most valuable subject taken during their school years (Margalit & Cassel-Seidenman, 1987). Independence is influenced by the opportunities to work through challenging tasks and the concomitant expectations of NH individuals for the student with a handicap to achieve just as anyone else.

Reports about the LOC attributions and the independence behaviors of youth with PI have been inconsistent. In view of (a) the hypothesized relationship of LOC perceptions to the acquisition of autonomous behaviors and (b) the demonstrated positive influences of educational experiences on LOC orientations for all individuals (Cohen, 1986; deCharms, 1979; Stipek & Weisz, 1981), educational programs for students with PI should include components designed to foster an internal LOC. An instructional focus on decision-making skills and self-help can emphasize the

aspects of students' lives over which they have control (Levenson & Cooper, 1984).

Attitudes

Attitudes may be representative of likes and dislikes (Horne, 1985) or emotions aroused by certain circumstances (Morgan, 1976). Negative attitudes toward a given group based on inaccurate information or counterproductive interactions have long term ramifications for psychosocial functioning and autonomous behavior of the discriminated group (Lefcourt, 1976). The attitudes of NH individuals towards persons with PI have been influenced by numerous factors (see Carpenter, 1988) including the visibility of the impairment (Goffman, 1974; Richardson, 1976), the situational aspects of interactions (Rosenbaum & Katz, 1980), and the severity of the handicap (Hirshoren & Burton, 1979).

The self-attitude of an individual often has been referred to as self-concept or self-esteem. This concept of self is formed in relation to the individual's environment and is a determinant of behavior (Mason, 1972). Findings about the self-concept of students with PI have varied (see Carpenter, 1988). Although some students with PI have experienced psychosocial problems related to self-esteem more often than their NH peers (Harvey & Greenway, 1984; McAndrew, 1979; Weitzman, 1984), other students with impairments have had a positive self-concepts (Ostring & Nieminen, 1982; Van Putte, 1979). The self-concept of students with PI may

be related to their perception of personal control. Seligman & Miller (1979) propose that "lowered self-esteem is dependent on making an internal attribution for helplessness" (p. 363).

Consequences of Attitudes

Role expectations. Nonhandicapped individuals hold certain role expectancies for individuals with PI that not only reflect the attitudes of the NH individual which may "have little relationship to reality" (Auxter & Pyfer, 1985, p. 18), but also demand conforming behaviors from the individual with PI. Societal expectations for persons with PI may resemble the expectations held for other in tact groups on the basis of group membership rather than on characteristics of the individual (Anderson, 1973). For the individual with PI stigmatization (Goffman, 1974) or relegation to a minority group status (Wright, 1960) results in concomitant expectancies by NH individuals that the person with PI is relieved from normal responsibilities and must act "sick" and dependent despite possible desires to do otherwise (Bartel & Guskin, 1980; Shontz, 1980).

Self-Efficacy. "Efficacy expectations reflect the individual's subjective estimate that he or she has the capacity to cope successfully with a threatening situation" (Wilson, 1979, p. 181). Efficacy expectations are an important aspect of the initiation, generalization, and maintenance of coping behavior as related to the "sick" or minority group roles. The attitudes

projected by others may affect the self-efficacy of the individual with PI (Gresham, 1984; Rich & Wuest, 1983; Schunk, 1985). Internal attributions for outcomes may also be related to feelings of self-efficacy. Wilson (1979) proposed that the development of strong self-efficacy is dependent on self-attributions for mastery behavior. Deci (1975) suggested that someone who is self-determining will feel efficacy.

Interaction patterns. The nonfacilitative attitudes of NH persons often have been manifested as negatively altered interaction patterns (see Carpenter, 1988), thus subtly communicating lower expectancies to the individual with PI that encourage dependency and hence inhibit progress toward self-sufficiency (Hegarty, Pocklington, & Lucas, 1982; Randolph & Harrington, 1981). Modified expectancies and interaction patterns may be evident in indiscriminate assistance (Cruickshank, Hallahan, & Bice, 1980; Hall & Porter, 1983), diminished educational opportunities (Downing, 1988; Hackney, 1984), and limited socialization opportunities (Brown & Gordon, 1987; McAnarney, 1985; Tin & Teasdale, 1985; Weitzman, 1984).

Although some adolescents with PI have been well accepted by their peers at school (DeApodaca, Watson, Mueller, & Isaacson-Kailes, 1985; Gillies & Shackley, 1988), others may have had particular difficulties with interpersonal relationships. Students with PI often have been passive participants in

interpersonal interactions at home (Brown & Gordon, 1987) and at school (McAnarney, 1985; Tin & Teasdale, 1985). Adolescents with PI have been reported to spend more time in social isolation and less time in out-of-home activities than NH students (Brown & Gordon, 1987). These differences in social experiences (a) further isolate the student from peers and (b) compound difficulties in achieving appropriate social behaviors (Weitzman, 1984) as well as the skills necessary to develop independence and positive self-concepts. It is not surprising that social skill training was deemed second in importance in evaluations of school experiences by individuals with cerebral palsy (Margalit & Cassel-Seidenman, 1987). Whereas inadequate experiences or opportunities may be partially responsible for socialization problems of youth with PI, dysfunctional communication patterns between persons with PI and NH individuals (Comer & Piliavin, 1972; Kleck, 1968, 1969; Kleck, Ono, & Hastorf, 1966) have been reported to contribute to strains in social interactions (Coker & Coker, 1985).

Communication Patterns

Interpersonal interactions between NH individuals and persons with PI have been characterized as consisting of dysfunctional communication patterns (Wiseman, Emry, Morgan, & Messamer, 1986). Adjustments in conversation content and nonverbal behaviors have been reported (Comer & Piliavin, 1972; Hackney, 1984; Kleck, 1968, 1969; Kleck, Ono, & Hastorf, 1966). Person and societal factors

have been associated with the altered communication behaviors that occur between individuals with PI and those without PI (Braithwaite, Emry, & Wiseman, 1984; Wiseman et al., 1986). Although communication includes verbal and nonverbal conversational behaviors (Coker & Coker, 1985; DeLoach & Greer, 1981; Fast, 1970; Wiseman et al., 1986), a limited amount of research has been reported about nonverbal communication behaviors.

The presence of a physical impairment can have debilitative effects on communication (Braithwaite et al., 1984; Coker & Coker, 1985; DeLoach & Greer, 1981). Coker and Coker maintained that the communication patterns of individuals with PI resemble those of apprehensive communicators. Apprehensive communicators are characterized by (a) variance in their communication apprehensiveness, (b) avoidance or passive participation in social situations requiring oral communication, and (c) negative self-perceptions as well as negative perceptions by others during communication. As the result of inadequate communication interactions, apprehensive communicators are perceived as generally less competent than less reticent communicators. Competent communicators are characterized by the ability "to choose among available communication behaviors in order that [they] may successfully accomplish [their] own interpersonal goals during an encounter" (Coker & Coker, 1985, p. 7). Social

impression management is a similar concept that is defined as "a strategy for manipulating, altering, or in other ways controlling certain aspects of nonverbal behavior for the sake of performing more creditably" (DeLoach & Greer, 1981, p. 232).

Verbal and nonverbal behaviors are essential to the communication process (Coker & Coker, 1985; DeLoach & Greer, 1981; Fast, 1970; Wiseman et al., 1986). Verbal conversation behaviors relevant to all communicators include "asking questions, initiating and maintaining conversations, paraphrasing, agreeing, disagreeing, giving and receiving compliments, and asking for behavior change" (Coker & Coker, 1985, pp. 16-17). Verbal skills that are particularly relevant to the interactions of individuals with physical impairments are self-disclosure about the disability, requesting reassurance and emotional support, and assisting the NH individual to overcome stereotypic biases (Coker & Coker, 1985; Wiseman et al., 1986). Nonverbal communication behaviors equal or exceed the importance of verbal communication behaviors in interactions between persons with disabilities and NH individuals (Coker & Coker, 1985). Relevant nonverbal communication behaviors (NCBs) include facial expressions, eye behavior, posture and body movements, physical appearance, touch, physical distance, and vocal qualities such as tone and pitch (Coker & Coker, 1985; DeLoach & Greer, 1981; Knapp, 1972).

Researchers have investigated verbal behaviors relevant to persons with PI (Braithwaite et al., 1984) as well as the effects of training on verbal behaviors such as self disclosure (Coker & Coker, 1985). A limited amount of research has been conducted to investigate the nonverbal communication patterns between individuals with PI and NH individuals. The most current nonverbal communication studies focused on perceptions about communication patterns using questionnaire formats (Braithwaite et al., 1984; Wiseman et al., 1986). Earlier studies used observational procedures in contrived situations to examine differences in behaviors during interactions between NH individuals and persons with PI (Comer & Piliavin, 1972; Kleck, 1968, 1969; Kleck, Ono, & Hastorf, 1966).

Braithwaite et al. (1984) used a questionnaire to ascertain whether subjects with orthopedic handicaps (n=27) perceived their communication with NH individuals as different than their communication with individuals with PI. Subjects responded to six negative communication behaviors characteristic of interactions. The subjects felt that compared to communicators with PI, NH communicators more frequently glanced away, stood further away, acted nervous, ended the conversation early, pretended to ignore the disability, and assumed a greater disability than actually existed in the subject.

Wiseman et al. (1986) designed a questionnaire about a helping situation in which a NH individual rendered unsolicited assistance to an individual with PI. The purpose was to determine (a) if subjects perceived normative demands on their behavior and (b) if there were differences in the normative demands identified by subjects based on their group membership. Nonhandicapped (n=102) and orthopedically handicapped (n=40) adults completed questionnaires. Both groups of subjects perceived that normative demands influenced the behaviors of the participants in the helping scenario. Whereas perception of self and actions to maintain a favorable self-image were deemed to influence the helping behavior of the NH individual, perceptions of self and actions to enhance the relationship with the NH individual were seen as responsible for the acquiescence of the individual with PI. Compared to the NH subjects, the subjects with PI perceived greater situational and societal demands on the disabled actor's behavior.

The reported perceptions of differences in nonverbal communication patterns corroborate behavioral discrepancies previously identified by researchers in observational settings (see Table 2). Some findings were present whether subjects were NH or had PI when interactions occurred between NH individuals and individuals with PI. The interaction distance was greater, motor activity was less variable, and interactions were terminated

Table 2

Studies of Nonverbal Communication Patterns

	Subjects	Research Scenario	Nonverbal Behaviors
Kleck, Ono, & Hastorf 1966	Nonhandicapped (NH) n=46 High School Males	Subjects conversing with a confederate posing as NH or physically impaired (PI)	Skin response; Interaction length; Head and hand movements
Kleck 1968	NH n=15 Males Junior/Senior High	Subjects conversing with a confederate posing as PI or NH	Head and hand movements; Eye contact (EC)
Kleck 1969	NH n=20 College Females	Subjects teaching a paper folding task to a confederate posing as PI or NH	Proxemity
Comer & Piliavin 1972	PI n=30 Ages 23-64	Interview by a confederate posing as PI or NH.	Interaction length; EC; Proxemity; Smiling

sooner than in interactions between persons with similar physical attributes (Comer & Piliavin, 1972; Kleck, 1968, 1969; Kleck, Ono, & Hastorf, 1966). Some findings varied for communicators with and without PI. Whereas eye contact was greater for NH-PI interactions than for NH-NH interactions (Kleck, 1968), eye contact in PI-NH interactions was less than in PI-PI conversations (Comer & Piliavin, 1972). Kleck (1968) noted that differences in his NH subjects' behaviors were greater when the subject was listening to the confederate speak than when the subject was talking. Kleck postulated that the greater eye contact during NH-PI interactions was an indication of information seeking behavior on the part of the NH subject. Kleck et al. (1966) reported that emotional arousal as measured by psychogalvanic skin response, was greater in NH-PI interactions. Comer and Piliavin (1972) foundthat subjects with PI smiled more in interviews in which the confederate had an orthopedic handicap than in the NH interviewer scenario.

As communicators, it should be noted that individuals with PI are not competent or incompetent (Coker & Coker, 1985). Similar to NH individuals, their effectiveness in interpersonal interactions varies with the situation. Many persons with physical impairments do not possess an adequate repertoire of skills that permit them to choose situationally specific

communication strategies that are appropriate and beneficial (DeLoach & Greer, 1981).

Although procedures to train NCBs have been advocated to enhance the communication competence and social skills of individuals with PI (Coker & Coker, 1985; DeLoach & Greer, 1981), research specific to the efficacy of training NCBs for individuals with PI has not been conducted. Individuals with PI have been successful in improving their verbal interactions with NH persons following training in self-disclosure and "break through" techniques (Belgrave, 1984; Evans, 1976; Mills, Belgrave, & Boyer, 1984). Training in NCBs may yield equally positive results.

Nonverbal communication behaviors have been recognized as an important component of the overt social skills necessary for students with learning disabilities to effectively participate in interpersonal interactions (Schumaker & Hazel, 1984a, 1984b). Moreover, NCB training has been incorporated in programs designed to enhance the education conference (Van Reusen, 1985) and classroom (Ellis, 1989) participation of students with learning disabilities. The students' performance levels during education conferences were not reported by Van Reusen. Adolescents' use of NCBs during classroom participation improved following training on a composite of nonverbal skills that had been determined to influence student teacher interactions (Ellis, 1989). The skills included in the training program included sitting up straight,

leaning forward, acting interested, head nodding, and visually tracking the teacher. Nonverbal Communication Behavior training for adolescents with PI may contribute to more positive communication interactions with teachers and NH peers that may subsequently affect classroom participation or self-advocacy skills. Teaching NCBs as an aggregate of skills could be problematic for students with PI. Inventorying each behavior for training may be a more feasible approach for adolescents who may not have the physical requisites to perform all aspects of the desired NCBs.

Coker and Coker (1985) combined treatment models typically used to approach the ineffective communication of apprehensive communicators and individuals with PI. They posited that physical disability causes communication apprehension which causes ineffective communication. Negative personal and social consequences are the result. Suggested treatment procedures included: social skills training (including nonverbal behaviors), counseling, and educational/vocational rehabilitation. DeLoach and Greer (1981) suggested phases that should be included in the training of nonverbal communication skills:

> Orientation to the role of gestures in impression management; the use and misuse of specific gestures as well as gesture clusters; situational role-playing practice using these behaviors [including videotaping]; feedback on the effectiveness of role-playing, and finally, actual practice in real situations with follow-up critiques and discussion of outcomes. (p. 244)

Summary

Motivation theorists have emphasized the importance of intrinsic motivation, the need to feel competent and self-determining, in relation to children's learning and achievement (Adelman, 1978; Deci, 1975; Deci & Ryan, 1985; Wittrock, 1986). Deci (1975) expanded on the consequence of intrinsic motivation:

> A person's intrinsic need for feelings of competence and self-determination makes him aware of potential satisfaction, which in turn provides the energy for him to set goals (i.e., to decide what to do) and to behave in such a way as to try to achieve these goals. (p. 100)

Learning strategies have been defined as actions and thoughts that occur during learning which affect motivation as well as the selection, acquisition, organization, and integration of new knowledge (Weinstein & Mayer, 1986). Metacognition theorists have associated students' use of learning strategies to improved performance on academic tasks and interpersonal behaviors. Students' acquisition and generalization of learning strategies have been related to instruction components incorporated in strategy training programs.

There is evidence that some individuals with PI are at-risk for LOC orientations and self-attitudes that have been negatively associated with autonomous behavior. Mutual expectations between NH individuals and individuals with PI that are based on inappropriate perceptions of abilities and/or intentions have contributed to differential interpersonal interactions. Nonverbal communication behaviors are one area of interpersonal interactions

in which altered behavior patterns may hinder the development of independence and autonomy in the person with PI.

Principles derived from motivation and metacognition theories are pertinent to a rationale for providing students with specifically designed strategies to enhance NCBs. Active versus passive student involvement in the acquisition of nonverbal communication skills is related to goal oriented behaviors and hence to ultimate goal attainment.

CHAPTER III
METHOD

The materials and methods for the investigation of a nonverbal communication training procedure for adolescents with physical impairments (PI) that incorporates motivational theory and metacognitive principles have been presented in this chapter. The chapter has been divided into five sections: description of the research questions, description of the subjects, description of the nonverbal communication behavior acquisition strategy, measurement systems and measurement procedures, student training paradigms, and experimental design and analysis.

Description of Research Questions

Several research questions were investigated in order to study the acquisition of nonverbal communication behaviors (NCBs) by adolescents with PI. The areas addressed in the questions include the students' use of NCBs during training practice sessions, simulated education conferences, and actual education conferences; the students' satisfaction with their NCBs; and teachers' satisfaction with the students' use of NCBs. The following questions were evaluated using a multiple baseline single subject experimental research design across behaviors.

Q1: What are the effects of training on the level of nonverbal communication behaviors exhibited by the subject during training sessions as compared to nonverbal behavior performances during baseline simulated education conferences?

Q2: What are the effects of training on the level, Stability, and trend of nonverbal communication behaviors exhibited by the subject during baseline and concurrent generalization simulated education conferences?

Q3: Does the subject generalize the use of newly acquired nonverbal communication behaviors to an education conference attended by special education teachers who were not present during training sessions and simulated conferences?

Q4: Do the subjects report satisfaction with the newly acquired nonverbal communication behaviors?

Q5: Do the subjects report satisfaction with the training procedures?

Q6: Do special education teachers report satisfaction with the student's nonverbal communication behavior performance during simulated education conferences after training?

Q7: Do special education teachers report satisfaction with the training procedures?

Description of the Subjects

Middle school students with PI (N=5) who attended classes designed for students with PI were trained using a metacognitive procedure to heighten their awareness and improve their use of NCBs. The subjects were eligible for special education services as set forth by state and federal guidelines. The school was located in Alachua County, Florida. Students with PI from several nearby counties attended the school. The students attended at least one mainstream academic class or were scheduled to attend a mainstream academic class the following school year. The eighth grade subjects were all scheduled to attend a local high school with a program for students with PI the following school year.

On the basis of their membership in the aforementioned program for students with PI, students were screened for inclusion in the study. The special education classroom teacher made recommendations and preliminary classroom observations were conducted in order to identify students who lacked consistent usage of appropriate NCBs. Five students were selected for training. None of the subjects had previously participated in an education conference nor had they received NCB training. Subject Three and Subject Five had been exposed to the concept of using eye contact and good posture during a job interview in a mainstream business class.

The classroom teacher stated that all students were physically capable of performing the specified NCBs. The physical therapist

who worked with the students at the school verified that there were no contraindications for the subjects associated with the NCBs selected for instruction. Approval for the youth to be trained, videotaped, and observed was obtained from the University of Florida Institutional Review Board (see Appendix A), the School Board of Alachua County, the students themselves, and the students' parents (see Appendix B).

Subject One

Subject One (S1) was a sixth grade black female, age 13 years 3 months. Subject 1 had an L3 level myelomeningocele and associated nonprogressive bilateral flaccid paralysis of her legs and feet. Subject 1 had a ventricular-peritoneal shunt for hydrocephalus. Intermittent bladder catheterization was necessary. Although there was no obvious deformity of the back, thoracolumbar scoliosis that had been detected in x-rays was reported. Medical reports documented that the student was capable of ambulating at school with ankle-foot orthoses. However, S1 preferred using a manual wheelchair and did not ambulate during school hours. Subject 1 transferred in and out of her wheelchair independently. The classroom teacher reported that although S1 was physically strong, her upper body movements were stiff. Subject 1 received physical therapy (PT) services at school. Fine motor abilities were intact. Hearing was within normal limits. Vision was approximately normal and uncorrected.

Subject 1 was first identified for special education services at about 3 1/2 years of age and was placed in a physical and occupational therapy program for children with PI. Subject 1 had been mainstreamed off and on since the first grade for music, science, social studies, and/or physical education. The maximum amount of mainstream placement was four to five hours per week. During her sixth grade year she was mainstreamed for homeroom and music only.

Intellectual function was within normal limits (see Table 3). Fourth grade standardized achievement test scores were the most current available (see Table 4). Subject 1 was achieving below grade level at that time. The classroom teacher indicated that S1 was reading on approximately a fourth grade level at the time of the project and continued to perform below grade level in math.

Subject Two

Subject Two (S2) was a sixth grade white female, age 12 years 10 months. Subject 2 had cerebral palsy and exhibited quadriparetic ataxic spastic patterns. Some athetotic movements were also present in upper and lower extremities. There was a profound and easily solicited primitive startle reflex as well as an absence of righting reactions (in the event of a fall). Subject 2 was uncoordinated when walking and used a wide base for balance during ambulation. Subject 2 received PT and occupational therapy (OT) services at school. During the sixth grade she began using a manual wheelchair for a portion of the school day and used

Table 3

Test Scores for Subjects' Level of Intellectual Functioning

Subject	Test	Date	Scale	Score
1	WISC-R	1989	Full Scale IQ:	81
			Performance	80
			Verbal	85
2	WISC-R	1989	Verbal	70
	K-ABC	1984	Mental Processing Composite	75
			Sequential Processing	91
			Simultaneous Processing	69
3	WISC-R	1987	Verbal	101
	K-ABC	1987	Mental Processing Composite	113
			Sequential Processing	109
			Simultaneous Processing	114
4	K-ABC	1987	Mental Processing Composite	91
	K-ABC	1983	Mental Processing Composite	83
			Sequential Processing	81
			Simultaneous Processing	87
5	WISC-R	1987	Full scale	101
	K-ABC	1987	Mental Processing Composite	104

Note. WISC-R: Weschler Intelligence Scale for Children-Revised

K-ABC: Kaufman--Assessment Battery for Children

Table 4

Subjects' Most Recent California Achievement Test Scores

Subject	Date	Grade in School	Subtest	Percentile	Stanine
1	1988	4	Reading	12	3
			Language	18	3
			Math	4	1
2	1987	3	Reading	24	4
			Language	18	3
			Math	1	1
3	1989	7	Reading	58	5
			Language	45	5
			Math	17	3
4	1989	7	Reading	3	1
			Language	2	1
			Math	10	2
5	1989	7	Reading	66	6
			Language	69	6
			Math	4	1

the wheelchair during most project sessions. Fine motor activities were characterized by involuntary motor patterns during volitional movement. Handwriting was difficult. Speech was mildly slurred. Hearing was within normal limits. Some strabismus was present in the right eye but vision was approximately normal and uncorrected.

Subject 2 was also characterized by extreme emotional lability during unfamiliar situations. She was unable to participate in the first scheduled simulated education conference due to extreme anxiety reactions. Additional desensitization was necessary in order for her to maintain emotional control in the simulated education conference setting. The classroom teacher joined S2 during a preliminary simulated education conference videotape session in which the principle investigator acted as the interviewer. The "pre" session lasted approximately 25 min and was not used for any scoring purposes. Following the more extensive desensitization procedure S2 was able to participate in all aspects of the project and interact with the varied personnel without further incident or additional interventions.

Subject 2 was first identified for special education services at approximately age 4 years and placed in a program for children with PI. Subject 2 had been mainstreamed intermittently since kindergarten for music, science, social studies, and/or physical education. The maximum amount of mainstream placement was four to five hours per week. An aide and computer access were necessary

for S2 to participate in science in a regular classroom in the fifth grade (1988-1989 school year). During the sixth grade school year she was mainstreamed for homeroom only and initially experienced difficulty controlling her emotional reactions during homeroom.

Intellectual function was within normal limits (see Table 3). Third grade standardized achievement test scores were the most recent group test scores available (see Table 4). Subject 2 was achieving below grade level at that time. The classroom teacher indicated that S2 was reading on approximately a fourth grade level at the time of the project and continued to perform below grade level in math. The grade equivalents for the achievement subtests of the Kaufman-Assessment Battery for Children (K-ABC) in reading comprehension, decoding, and arithmetic were 5.4, 5.7, and 2.5 respectively.

Subject Three

Subject Three (S3) was an eighth grade black male, age 13 years 9 months. Subject 3 had long standing juvenile rheumatoid arthritis, as well as Bell's palsy of the left side and left hemiparesis. Subject 3 was obese and had limited movement of his arms and legs. Ambulation was usually labored and shuffling. Subject 3 was recovering from ankle surgery and occasionally used a manual wheelchair at school. However, wheelchair usage had been mostly discontinued by the end of the project. Subject 3 did not use a wheelchair during any project sessions. Bimanual dexterity

was poor. Consequently, the performance portion of tests reported in school records were routinely omitted. Physical strength was markedly low. Subject 3 received PT and OT services at school. Some strabismus was present and glasses had been prescribed but were not worn. Speech and language was within normal limits. Hearing was approximately normal.

Subject 3 was first identified for special education services in 1983 and was placed in a specific learning disabilities (SLD) program the following year (in approximately the third grade). In the sixth grade S3 was dismissed from the SLD program and placed in the program for students with physical impairments. Mainstreamed classes during the eighth grade included social studies, reading, home economics, and homeroom.

Intellectual function was within normal limits (see Table 3). Seventh grade standardized achievement test scores were the most current available (see Table 4). The classroom teacher indicated that S3 was reading on grade level (eighth) at the time of the project but continued to perform below grade level in math.

Subject Four

Subject Four (S4) was an eighth grade white male, age 15 years 7 months. Subject 4 had cerebral palsy and exhibited left-sided hemiparesis. He was slightly overweight and had poor muscle tone. Use of the left arm and hand was minimal although possible. Subject 4 was completely ambulatory but had a slight limp. Gross motor patterns were clumsy although the student could run and jump

well. Fine motor patterns were not problematic on the right side. Handwriting was poor but primarily due to refusal to stabilize paper with the affected left hand. No tremors nor extraneous muscle activity were present. Subject 4 received PT and OT services at school. Vision was normal. Hearing was somewhat affected on the left side but normal on the right. The classroom teacher characterized S4 as highly distractible with a history of making initial improvements but failing to maintain gains.

Subject 4 received therapy services beginning at three years of age but was not identified for special education services until approximately the third grade. Subject 4 began the eighth grade school year in five mainstream placements: reading, math, physical education, music, and homeroom. However due to lack of performance in those settings, the mainstream placements were changed to home economics and homeroom only.

Intellectual function was within normal limits (see Table 3). Seventh grade standardized achievement test scores were the most current available (see Table 4). Subject 4 was achieving below grade level at that time. The classroom teacher indicated that S4 was reading on approximately a third grade level and continued to perform below grade level in math.

<u>Subject Five</u>

Subject Five (S5) was an eighth grade white female, age 13 years 9 months. Subject 5 had chronic nonprogressive ataxic syndrome resulting from viral cerebritis at 4 years of age. Her

gross motor patterns were clumsy as evidenced in her gait. Ambulation was characterized by an increase in base, unsteadiness, and difficultly in changing directions too quickly. Subject 5's fine motor patterns were characterized by unintentional tremors that interfered with handwriting and eating. Nystagmus as well as vertical and horizontal ocular dysmetria were present. Subject 5 wore glasses for reading. Her speech was mildly slurred and S5 received speech therapy services at the school. Hearing was within normal limits. Some emotional lability was present.

Subject 5 attended a regular school and attended mainstream classes through the fifth grade but was performing poorly. She was first provided special education services in the sixth grade within the unit for students with PI. Subject 5 attended reading and science in mainstream classes in the sixth grade. During the eighth grade school year she was mainstreamed for language, social studies, reading, home economics, and homeroom.

Intellectual functioning was within normal limits (see Table 3). Seventh grade standardized achievement test scores were the most current available (see Table 4). The classroom teacher indicated that S5 was reading at/or above grade level at the time of the project but continued to perform below grade level in math.

Description of NCB Acquisition and Generalization Strategy

Each subject was trained in a metacognitive procedure designed to improve NCBs appropriate for an education conference. The subjects were instructed to (a) inventory their physical strengths

and limitations; (b) list important performance components of the targeted NCB; (c) based on the inventory decide if they were able to perform the given NCB or if an approximation of the behavior was necessary; (d) if warranted, identify possible skill improvements or modifications as well as relevant cues for remembering how to use the skill; (e) evaluate the effectiveness of their behavior performance; and (f) set goals to use the NCBs during education conferences and other settings as desired.

Strategy Steps

An acronym was developed to help the subjects remember the steps of the strategy. The first letter of the first word in each step of the strategy corresponded to a letter in the acronym IMAGES. The steps of the strategy were verbally rehearsed until the subject could recite them from memory. The strategy steps were:

1. I Inventory your physical abilities.
2. M Make a note of skill requirements.
3. A Ask if there are differences.
4. G Gather ideas for doing the skill.
5. E Evaluate your performance.
6. S Set goals to use the skill.

The strategy steps were applied to NCBs in this investigation but were worded so that they could be applied to a wide range of physical tasks or behaviors.

In the first step the students completed an inventory of their physical abilities by answering questions about their physical attributes and listing their physical strengths within several areas. Next the students listed the targeted NCB and the physical skills needed for successful performance of the NCB (ie., a definition of the NCB). The student then compared the physical skills needed for success to his/her personal inventory of physical strengths to determine if he/she had the physical requisites to perform the NCB appropriately. If the student had the requisite skills then only improvement was necessary for NCB performance. If a discrepancy existed between the requisite skills and the student's physical capabilities the student would specify an alternate form of accomplishing the intent of the particular NCB. The student then wrote ideas for doing the NCB including what, how, where, when, and why on the worksheet. The student also wrote the NCB and a short "cue" about how to perform the NCB on a cue card. The purpose of the cue card was to help the student think about using the NCB outside of the instructional setting. During the instructional session the student was encouraged by the strategy trainer to take the cue card to education conferences or classes where the student wanted to practice the NCB. However, specific reminders were not provided immediately prior to the simulated education conferences and the use of the cue card was at the student's discretion.

Next the student and strategy trainer evaluated the effectiveness of the modified skill components using the role-play conference cards. The student orally answered the questions on the cards while practicing the NCB. If the performance was evaluated negatively the student returned to strategy step "G" to think of alternative ideas for performing the desired behavior. The new behavior components were evaluated as before.

Student Materials

The materials that the students used during strategy instruction were included as Appendix C. The materials were designed to assist the student in learning the NCB acquisition strategy and in applying the strategy to specific NCBs. The materials included:

1. Strategy overview sheets which included (a) the steps of the strategy, (b) instructions for completing each step and (c) nonverbal communication behaviors and their definitions.
2. Student worksheets which included (a) a physical abilities questionnaire; (b) an inventory of physical abilities form; (c) an IMAGES prompt sheet for verbal rehearsal; (d) a worksheet to assist the student in listing the NCB requirements, deciding if behavior modifications were necessary, and gathering ideas for performing the NCB; (e) cue cards to aid in remembering to perform the NCB; and (f) a form for writing NCB goals.

3. Student performance forms which included (a) a strategy goal statement and signature page; (b) a strategy completion plan; and (c) a student progress chart for graphing NCB performance data during training.

Measurement Systems and Procedures

Two general types of measures were obtained: behavioral performance scores and social validation measures. The behavioral measures consisted of the nonverbal communication behaviors that the subjects displayed during training sessions, simulated education conferences, and an actual education conference. Also performance measures were obtained for personnel behaviors during training sessions ad simulated education conferences. The social validation measures included questionnaires given to the subjects and to their special education teachers. The questionnaires were designed to obtain the individuals' perceptions about different aspects of the nonverbal communication training program.

Student Nonverbal Behavior Performance Measures

The NCBs to be observed and trained were in two of the general categories identified by DeLoach and Greer (1981) as particularly relevant to the improvement of the nonverbal communication of individuals with PI: physical demeanor and facial expression. Three discrete observable behaviors from each category are further defined below and the data collection parameters are outlined.

Operational definitions

The nonverbal behaviors were the dependent variables. The following operational definitions were used as scoring guidelines during data collection sessions throughout the baseline and concurrent generalization, training, and subsequent generalization phases of the project. All subjects were deemed capable of performing the behaviors prior to project implementation.

Physical demeanor. For the purposes of this study, physical demeanor included posture and upper extremity positions. The cluster of behaviors included the positioning of hands and arms, sitting up straight, and leaning forward.

The desired positions for arms and hands included: (a) arms unfolded, (b) upper arms adducted and approximately perpendicular to the floor or shoulder flexion of no more than 45 degrees, (c) elbows slightly flexed between approximately 45 and 135 degrees, (d) palms slightly extended and facing up with fingers relaxed or palms are facing each other with fingers slightly touching but not clasped, and (e) hands resting on the table. Hands in the subject's lap was distinguished from hands on table for scoring. Consequently hands on the table and hands in the subject's lap were mutually exclusive behaviors.

Sitting-up-straight involves alignment of the torso, shoulders, and head. It was assumed that the subject was sitting in a straight back chair with a firm seat or in a similarly structured wheelchair. Sitting-up-straight was defined as (a)

torso straight; (b) hips and buttocks pushed back in chair seat; (c) shoulders parallel to hips, not hunched or rounded, and scapulae touching chair back; and (d) head positioned over shoulders, erect or slightly tilted to the side.

Leaning forward included the components of sitting-up-straight with the exception that the shoulder position was slightly forward of the hips and scapulae were not touching the chair back. In this position the scapulae were approximately three or more inches from the back of the chair and the subject's waist or lumbar region would be away from the chair back as well. The forward lean should not exceed 45 degrees. In an alternative position the subject was sitting toward the front of the chair and no part of the subjects' back was touching the chair back. Leaning forward and sitting-up-straight were mutually exclusive behaviors for scoring purposes.

<u>Facial expression</u>. For the purposes of this study facial expression consisted of eye behavior, mouth gestures, and head movements. Specifically the skill cluster included eye contact, smiles, and head nods.

Eye contact implied mutual glancing. In order to determine whether eye contact occurred between the subject and the interviewer on the basis of videotapes, an adaptation of Kleck's (1968) method was used to define the behavior. The video camera was positioned just behind and to the left of the interviewer so that body length pictures of the subject were obtained. The

interviewer was instructed to gaze naturally and continually at the subject. Therefore, eye contact was assumed to occur any time the subject looked (eyes open) toward the interviewer with head positioned in the midline of the body and chin level.

DeLoach and Greer (1981) defined several types of smiles. The "simple smile" and "the upper smile" were used for the purposes of this study. Therefore smiling was defined as "the corners of the mouth are pulled slightly back but the teeth are not exposed . . . [or] . . . the corners of the mouth are pulled back and the upper lip exposes portions of the teeth" (DeLoach & Greer, 1981, p. 240).

Head nods were defined as vertical movements of the head (DeLoach & Greer, 1981) while the interviewer or teacher was speaking or in immediate response to the interviewer or teacher speaking. For the purposes of this study head nods could be (a) a single quick nod, (b) a slow repeated nod, or (c) several quick nods. Horizontal rotation of the head, shaking the head, was not included in the definition.

Data collection parameters for baseline and generalization

Several factors were pertinent to the collection of behavioral measures. Videotaped behavioral measures were obtained during the baseline, concurrent generalization, and subsequent generalization phases of the investigation (see Procedures, this chapter for a description of these phases). The data collection system was the same for baseline, concurrent generalization, and subsequent

generalization phases. However in order to obtain a concurrent generalization measure nonverbal behavioral data was obtained for each subject during a video recorded simulated education conference following each session of instruction (Phase Three--see procedures this chapter). There was usually a time lapse of one hour or more between the strategy instruction session and the simulated education conference. Due to scheduling constraints the amount of time between instruction and the simulated conference was not held constant.

Simulated education conference setting. During baseline and concurrent generalization phase, videotaped behavioral measures were obtained during a simulated education conference (SEC) between the subject and an interviewer. The interviewer was a volunteer not previously known by the student. Only one subject participated in a conference at a time. Other subjects were not present during SECs. Observers were present during some simulated conferences to score the interviewer for consistency of behaviors.

The SEC occurred in a 10 ft 6 in X 2 ft 6 in room free of distractions. The interviewer sat behind a small square (2 ft 6 in X 2 ft 6 in) table, that was 27 inches high. The height of the table was similar to the table heights used in the subjects' classroom. This feature was necessary in order to accommodate the subjects' wheelchairs. The subject sat in a designated straight-back wooden chair (or the subject's wheelchair) at the opposite side of the table from the interviewer. The location of the

table, the interviewer, and the subject remained the same for all baseline and concurrent generalization data collection sessions. Two additional chairs were placed behind and to the right of the subject to provide seating for observers. Some other furniture was in the room but remained the same for the duration of the project. An RCA Camcorder video camera on a tripod was placed slightly behind and 45 degrees to the left of the interviewer so that pictures of the subject's torso were obtained. The slight angle was necessary in order to adequately see the subject's posture and eye gaze for scoring purposes. The camera lens was approximately at the subject's eye level when the subject was seated. The distance from the subject to the camera was 9 ft 6 in. The area filmed (ie., the lens angle and width) remained constant throughout all SEC sessions. The session number was recorded for each new session. The session date and time were also recorded. A separate videotape was used for each subject.

The SEC lasted approximately 5 min for each session. The interviewer asked the subject open-ended questions related to aspects of the students school experiences. The questions were selected from a pool of 50 questions (see Appendix D) and varied daily. The interviewer prompted the subject as necessary to get a verbal response, but the students' nonverbal behaviors, not the verbal content of their answers, were of interest.

<u>Actual education conference setting</u>. During the subsequent generalization phase, videotaped behavioral measures were obtained

during an actual education conference between the subject and two special education teachers. The teachers had classroom experience with the students for at least one school year. Only one subject participated in an actual conference at a time. Other subjects and observers were not present during the education conference.

The actual education conference (AEC) occurred in the school in a large classroom in the unit for students with PI. The teachers sat beside each other on one side of a rectangular table approximately 2 ft 6 in wide, 6 ft long, and 27 inches high. One teacher (T1) was seated close to the end of the table and the other teacher (T2) was seated approximately at the midpoint of the length of the table. The subject sat in a straight-back wooden chair (or the subject's wheelchair) at the opposite side of the table from T1. This position was necessary in order to adequately see the subject's posture and eye gaze for scoring purposes.

The AEC was video recorded using the same RCA Camcorder video camera and tripod that were used during the SECs. The camera was placed slightly behind and 45 degrees to the left of T1 so that pictures of the subject's torso were obtained. The height of the camera lens was the same as the height during SECs ie., approximately at the subject's eye level when seated. The distance from the subject to the camera was 9 ft 6 in.

The length of the AEC varied but was a minimum of 5 min for each subject. The teachers reviewed the student's individualized education plan (IEP) for the following school year with the

subject. The teachers were requested by the principle investigator to include opportunities for students to respond to open-ended queries. Some open-ended questions similar to the SEC questions (see Appendix D) were provided for the teachers. However, the actual content and sequence of topics of the AEC was determined by the teachers themselves.

Scoring system for subject performances. Trained volunteers viewed the videotapes of the simulated conferences daily and the actual education conference at the end of the project. The scorers did not know which NCBs were receiving instruction and which were not. A time sampling method was used to provide an estimate of nonverbal behavior frequency (Hall, 1974; Tawney & Gast, 1984). Operational definitions for the scorers are located in Appendix E. A data collection device, the Assistant (tm) Data Acquisition Computer, was used by the observers as a timing device. When a tone from the device sounded at the end of a 12 s interval the observer paused the videotape and recorded the nonverbal behaviors, except head nods, occurring at that moment on a data collection form (see Appendix F). The occurrence or nonoccurrence of appropriate head nods were recorded during the 12 s interval between pauses in the videotape. In order to obtain a measure of the amount of time that the interviewer or teachers spent talking versus the opportunities for the subject to respond the observer(s) also recorded whether or not the interviewer was speaking at the end of each 12 s interval when NCBs were recorded.

The observation intervals were limited to 25 intervals for each session and subject. The recorded behavior frequencies were converted to percentages of observation intervals.

$$\text{Behavior \% Of Observation} = \frac{\text{behavior occurrences}}{\text{session intervals (ie., 25)}} \times 100.$$

The results for the subjects' nonverbal behavior performances are reported in Chapter IV.

Interobserver reliability. Interobserver reliability checks were conducted for 40% of the SEC data collection sessions and therefore exceeded the minimum percentage (ie., 20%) of reliability checks usually recommended for single subject research designs (Wolking, personal communication, 1989). Three reliability coefficients were calculated (a) total percent agreement; (b) occurrence agreement, and (c) nonoccurrence agreement (Tawney & Gast, 1984). Total percent agreement, using the point-by-point method, was calculated with the formula:

$$\text{Total \% agreement} = \frac{\text{agreements}}{\text{agreements + disagreements}} \times 100.$$

Occurrence agreement was calculated with the same formula but using only those intervals in which one or both of the observers recorded an occurrence. Likewise nonoccurrence agreement was calculated except that only those intervals for which the behavior did not occur were used. An 85% agreement was desired. Interobserver reliability for the nonverbal behavioral measures is reported in Chapter IV.

Data collection parameters during instructional sessions

The data collection system for subjects' NCB performances during instructional sessions differed from the data collection methods used for the videotaped baseline and generalization sessions. Student NCB performance measures were obtained only during the skill practice steps of the instructional sessions (see Strategy Instructional Procedures in this chapter) and only for the NCB taught during a particular session. Nonverbal communication behavior performance measures during practice sessions were obtained in the instructional setting and were not videotaped.

In order to evaluate the subject's performance of the targeted NCB the strategy trainer asked the student a series of open-ended questions. The questions were identical to the questions used by the interviewer in the simulated education conference (see Appendix D). The NCB operational definitions used by the strategy trainer were identical to the definitions used by the observers who scored the subjects' videotape NCB performances (see Appendix E). However instead of evaluating the NCB performance at 12 s intervals, the strategy trainer scored the subject's performance for each question/answer interval. If the student exhibited the target NCB most of the time while a question was asked and answered, the student received a positive score for that question/answer interval.

The strategy trainer recorded the subject's scores on a practice and feedback score sheet (see Appendix G). The questions were asked in sets of five questions per set. The subject's score for a question set was converted to a percent of correct performances for that set using the formula

$$\text{Set score--\%} = \frac{A}{B} \times 100.$$ Where A and B are defined as:

A = # of questions answered while correctly performing the NCB

B = # of questions in set (ie., 5)

Mastery criteria for a given question set required a positive score on four-out-of-five questions in the set. At the end of the practice session a percent score was calculated using the scores from the last two question sets of the session using the formula:

$$\text{Session score--\%} = \frac{\text{set score--\%} + \text{set score--\%}}{2}$$

The session score percentage was then plotted by the student on a student progress chart (see Student Materials in this chapter). The session was terminated (a) when the student achieved question set mastery for two consecutive question sets or (b) when the session time limit, approximately 20 min, had elapsed. If skill practice mastery was not achieved during a session, the student repeated the skill practice during the next session and subsequent sessions until skill practice mastery was achieved for a total of three consecutive sessions--with a minimum of one session of guided practice mastery and two sessions of advanced practice mastery (see Instructional procedures in this chapter).

Social Validation Measures

Social validation was of interest as a means of establishing the social importance of the intervention (Tawney & Gast, 1984). Three levels of social validation typically include: (a) the goals or intended outcomes of the research, (b) the procedures used in the intervention, and (c) the practical effects. Questionnaires designed to assess the participants satisfaction with the instructional program were given to subjects (see Appendix H) and their teachers (see Appendix I). The answer format was similar to the format used by Maheady, Harper, and Sacca (1988) to assess student satisfaction with a peer tutoring program. Prior to completing the questionnaire teachers (a) conducted an actual education conference with each subject and (b) viewed a videotape of the student's performance from a baseline session and an end-of-training data collection session. The specific information of interest in this study was the participants' feelings about the general importance of nonverbal communication behaviors, the feasibility of the instructional program, and the effects of training on the subjects' nonverbal behaviors. Subject and teacher satisfaction results are reported in Chapter IV.

Personnel Performance Measures

Specified personnel behaviors were deemed to be relevant to the consistency of the intervention and data collection conditions. A minimum level of performance on the appropriate behaviors was desired for both the strategy trainer and the

interviewer. Prior to beginning instruction of each step of the strategy the strategy trainer was required to demonstrate (a) an understanding of the intent of instruction for the step and (b) appropriate use of the script and materials. The relevant behaviors for the strategy trainer included following the script, following the sequencing of the script, using the materials correctly, and fluent pacing of the instruction (King-Sears, 1989). The interviewers were required to display the composite of specified behaviors for at least 90% of the observation intervals. The minimum performance level desired for smiling was 50%. The pertinent behaviors for the interviewer were looking at the subject, smiling, following the scripted questions, and fluent pacing during the conference. During the course of the investigation an 80% minimum performance level was desired for all personnel behaviors except interviewer smiling. Additional documentation of instructional consistency was obtained for each step of instruction across subjects by recording the amount of time spent during instruction for each subject. Personnel performance results are reported in Chapter IV.

Independent observers recorded the appropriate personnel behaviors using a time sampling method at 30 s intervals for the first 4 min, minimum, of the instructional session and the simulated conference. A Time Sampling Recording Form was used for recording the appropriate behaviors for the interviewer and the strategy trainer (see Appendix J and Appendix K respectively).

The interval box was checked to indicate occurrence of the behavior at the sound of a prerecorded tone. Behavior frequencies were converted to percentages using the formula:

$$\text{Behavior \%} = \frac{\text{behavior occurrences}}{\text{observation intervals}} \times 100.$$

Interobserver reliability was calculated for total percent agreement (point-by-point method) and nonoccurrence agreement. The formula is:

$$\text{Interobserver Reliability} = \frac{\text{agreements}}{\text{agreements + disagreements}} \times 100.$$

For nonoccurrence agreement, only the intervals in which one or both observers did not record an occurrence were used in the calculation. Interobserver reliability for personnel performance measures are reported in Chapter IV.

Procedure

This investigation was divided into four general phases. Personnel, including the strategy trainer, the interviewer, and observers, were trained in Phase One. In Phase Two baseline and concurrent generalization (Ellis, Lenz, & Sabornie, 1987a, 1987b) data were collected on the subjects' performance of NCBs during videotaped simulated education conferences with the interviewer. For concurrent generalization measures the subjects' NCBs were video recorded in a simulated education conference following daily instruction (Phase Three) for the duration of the training. The instructional intervention was implemented in Phase Three. During this phase the subjects' NCBs were evaluated during the practice

steps of the instructional procedures. In Phase Four the subjects' subsequent generalization of NCBs to an actual education conference with teachers who were not present during training nor simulated conferences was evaluated. Additionally, the satisfaction of the subjects and teachers was assessed in Phase Four.

Personnel Training (Phase One)

Personnel involved in the investigation included two interviewers, one strategy trainer, two nonverbal performance observers/scorers, and two personnel observers. The principle investigator was one of the personnel observers. All personnel were volunteers and were affiliated with the university as either students or staff. Only the principle investigator and the strategy trainer had training in the field of education although both interviewers had some previous experience as volunteers with children with PI. The strategy trainer was a doctoral student in special education and had experience teaching the learning strategies curriculum developed at the University of Kansas--Institute of Research on Learning Disabilities. All personnel were considered an integral component of the study in order to avoid potential biases in data collection and intervention.

The personnel attended several training sessions including an orientation. The training was conducted at the University of Florida and at the school site. The training agenda is outlined in Appendix L. Training continued on an as needed basis until

criterion was reached on identified competencies as specified previously. The principle investigator and personnel observer observed and recorded the interviewers' and the strategy trainer's performance of specified behaviors.

The interviewers did not know that the students were receiving instruction on NCBs. One interviewer participated for only two consecutive simulated education conference sessions for some of the subjects during the last week of the investigation (see Chapter IV results). The primary interviewer conducted the rest of the simulated education conferences during baseline and concurrent generalization. Both interviewers received approximately 1 hr of training prior to beginning participation. Feedback about their simulated education conference performance was provided following visits by the personnel observers.

The nonverbal behavior performance observers/scorers were aware that NCB training was occurring but did not know which subjects were receiving instruction on given NCBs. Both NCB observers/scorers received approximately 8 hrs of training, first using videotapes of students without PI and then using the first few baseline videotapes of the subjects used in the investigation. Eye contact was the most difficult NCB for the scorers to reach criterion reliability. It was necessary to use videotapes of the actual subjects so that the scorers could recognized individual subject's eye characteristics and reconcile the eye movements and characteristics with the operational definition. For example,

some subjects' eyes and skin were very dark, thus making it difficult to recognize eye positions. However, after intensive training with the operational definition and the videotapes the scorers were able to reliably record eye contact for each subject regardless of skin and eye color.

The strategy trainer received approximately 10 hrs of training in the procedures of the IMAGES strategy. The strategy trainer received qualitative and quantitative feedback from the principle investigator about the delivery of instruction following instructional sessions with the subject's throughout the various stages of instruction (see Instructional Procedures in this chapter). The strategy trainer also received feedback before each daily instruction session about the subjects' simulated education conference NCB performance scores from the previous session.

Baseline Condition and Concurrent Generalization (Phase Two)

Subjects participated individually in simulated education conferences. The interviewer asked the subject open-ended questions (Comer & Piliavin, 1972; Kleck, 1968; Kleck, Ono, & Hastorf, 1966; Van Reusen, 1985) pertaining to school experiences (see Appendix D). The subject's performance was video recorded for later scoring. Neither feedback nor instruction was given to the subjects by the interviewer regarding their performances on any behavior during the baseline and concurrent generalization phase. Baseline conditions were continued for a minimum of three sessions or until a stable baseline trend or decelerating trend

(Tawney & Gast, 1984) below mastery criteria was evidenced on at least one of the nonverbal behaviors targeted for the investigation. Baseline performance below mastery criteria (as stipulated in instructional procedures) was required in order for an NCB to be eligible for instruction because of the recommendations within effective teaching literature that there should be a match between instructional needs and the instruction delivered (Brophy & Good, 1986; Christenson, Ysseldyke, & Thurlow, 1989; Rosenshine & Stevens, 1986). The baseline condition served as a preinstruction measure of student NCB performance. Instruction on proficient behaviors was not warranted. Once a stable baseline below mastery level of behavior occurrence was obtained for a behavior, the instructional intervention began for that behavior.

Concurrent generalization measures were collected for the behavior receiving intervention. Baseline conditions continued for all other nonverbal behaviors. When an accelerating trend or mastery level performance was evidenced on the first targeted behavior for three consecutive training data collection sessions, training began on a second NCB with baseline conditions continuing for the remaining four NCBs. It should be noted that the decision to begin training on a new behavior was based on the subject's performance of the intervention behavior during training sessions. In other words intervention decisions for the second and third NCBs were not based on the subject's concurrent generalization of

Sessions

Behavior	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Sit up	.	.	.	.	.	.	+	+	+	+	*	*	*	*	*	*	*	*	*	*	#
Smile	.	.	.	.	.	.	.	.	.	.	.	.	+	*	*	*	*	*	*	*	#
Eye Contact	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	*	*	*	#
Lean Forward	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	#
Arms/Hands	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	#
Head Nods	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	#

Note: . Baseline * Mastery/Maintenance

\+ Instructional Interventions # Subsequent Generalization

Figure 1. Sample time line for baseline, intervention, mastery/maintenance, and subsequent generalization conditions for nonverbal communication behaviors. (Sample intervention behaviors are sit-up, smile, and eye contact.)

the previously trained NCBs but solely on training session performance of the targeted NCB.

When an accelerating trend or mastery level performance was attained on the second targeted NCB for three consecutive training sessions, training began on a third NCB with baseline conditions continuing for the remaining NCBs (see Figure 1). Therefore, the nonverbal behaviors included during instructional intervention were selected for each subject based on the baseline performance of the NCBs. Based on the priority of the NCB, a total of three behaviors on which the subject scored below mastery level during

baseline were selected by the principle investigator and the classroom teacher for instructional intervention. Sitting-up-straight and then eye contact were the first training priorities for all subjects. Thereafter the NCB training priority was determined for each subject individually based on the baseline NCB that seemed to be the most detrimental to the subject's overall image.

It should be noted that if there had been no or minimal evidence of NCB performance improvement after five sessions in which practice and feedback occurred, instruction would have begun for another NCB on the basis of the baseline criteria set forth above. However, all subjects in the present investigation evidenced improvement in NCB performance during training sessions.

Instructional Intervention (Phase Three)

The general format of the instructional intervention followed the steps of acquisition and generalization used within the learning strategies curriculum at the Kansas University--Institute of Research on Learning Disabilities (Deshler & Schumaker, 1986; Schumaker, Deshler, Alley, & Warner, 1983). These procedures have been determined to be effective with low achieving students. Furthermore, the instructional sequence incorporated the elements recommended by DeLoach and Greer (1981) for facilitating physically impaired individuals' acquisition of NCBs: gesture orientation, role playing, videotaping NCB performance, feedback on performance, and practice in real situations. Finally,

effective teaching principles that have been positively associated with student achievement were included in the instructional methodology. These instructional precepts include: (a) clear and specific goals of instruction; (b) monitoring for student understanding; (c) performance feedback that is immediate, explicit, and corrective (Brophy, 1987; Brophy & Good, 1986; Christenson et al., 1989; Porter & Brophy, 1988; Rosenshine & Stevens, 1986); (d) active student participation and frequent student-teacher interaction (Brophy, 1987; Brophy & Good, 1986; Christenson et al., 1989; Rosenshine & Stevens, 1986); (e) instructional decisions based on performance data and student's performance fluency (Christenson et al., 1989; Rosenshine & Stevens, 1986); (f) formative evaluations (Christenson et al., 1989; Fuchs, 1986); (g) graphic display of performance data (Fuchs, 1986); and (h) frequent review of previous material (Christenson et al., 1989; Rosenshine & Stevens, 1986).

Strategy instructional procedures

The role of the strategy trainer was to instruct and assist the subjects in the NCB acquisition and generalization process and to give specific feedback on NCB practice trials. The instructional sessions were conducted for 20 to 40 min per school day for the duration of the investigation. Each subject received approximately 7 hrs of instruction and skill practice across 18 school days. Instruction occurred during time that the student

was scheduled to be in the special education classroom and supplemented the regular curriculum for the duration of the study.

There were two stages of training for each NCB for each student: (a) strategy instruction and (b) skill practice. Each stage has several steps. The steps of strategy instruction were orient, describe, model, verbal rehearsal, and prepare. Skill practice consisted of guided practice and feedback, advanced practice and feedback, and generalization. Figure 2 contains an illustration of the sequence of instruction in this investigation for three NCBs. Instruction for orient, describe, and verbal rehearsal was delivered to the subjects in a group. Instruction for model, prepare, guided and advanced practice, and generalization was delivered to the subjects individually in order to maintain experimental control of the subjects' exposure to instruction on the specific NCBs.

The strategy trainer (ST) began instruction by introducing the student to the importance of NCBs and obtaining the subject's commitment to learn the NCB acquisition strategy. Next the ST described each component of the IMAGES strategy and assisted the student in setting completion dates for the instructional steps. The ST modeled applying the IMAGES strategy to a NCB. Next the student committed the strategy components to memory through verbal rehearsal of the IMAGES components. With ST assistance and feedback during the instruction of step five--Prepare, the student applied the IMAGES strategy to the targeted NCB. Instructional

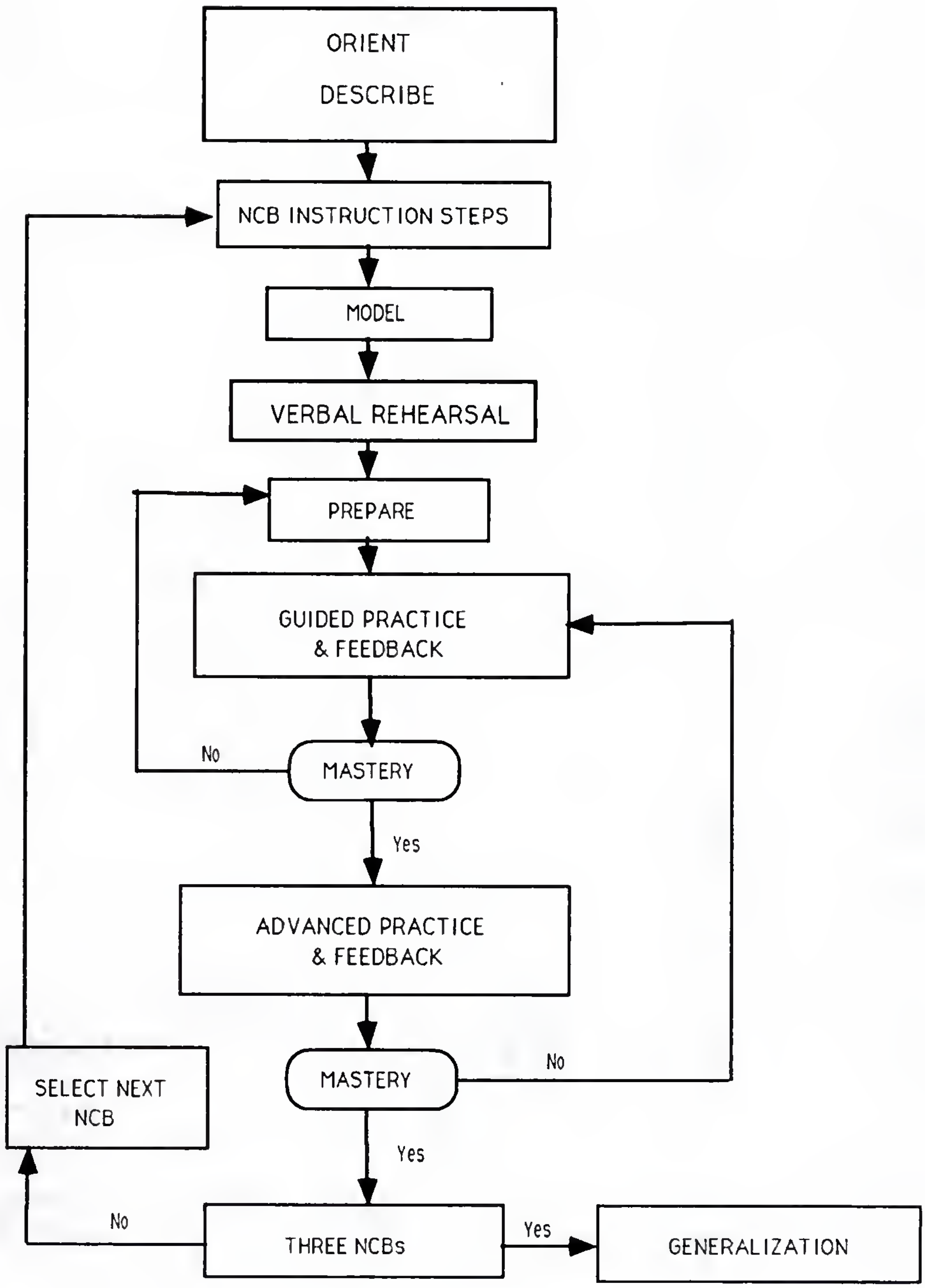


Figure 2. Strategy instructional procedures flowchart.

steps six and seven consisted of student skill practice and feedback provided by the ST. In step five--Prepare and in step seven--Advanced Practice the ST prompted the student to evaluate his/her use of the targeted NCB during the videotaped simulated education conference (SEC) that followed the previous instructional session. The ST feedback to the subjects about SEC performances was qualitative in nature. Specific quantitative feedback in the form of frequency or percentage of behavior occurrence during the SEC was not provided. Training data on the student's performance of the targeted NCB were collected in steps six and seven. An actual education conference to evaluate subsequent generalization (see Phase Four) was conducted when mastery performance on three NCBs had been achieved during skill practice. An outline of the specific content and sequence of instruction for this investigation is presented in Appendix M.

Instructional materials

The strategy trainer (ST) used a scripted lesson format to ensure consistency of instructional content for all subjects. A portion of the script is included in Appendix N. The IMAGES Teacher's Manual with the entire lesson script and materials as developed for this project is available from the principle investigator. In addition to the scripted lessons the ST used effective instruction techniques such as rapid pacing; active student involvement through questioning; positive reinforcement; and immediate, corrective feedback. The ST used the materials

included in Appendix O to assist in the delivery of the IMAGES strategy instruction. The ST used a verbal rehearsal checklist to evaluate the students knowledge of the IMAGES strategy steps (see Appendix G). The ST used score sheets in step six and step seven to assist in observation and feedback of the subject's practice of the NCB (see Appendix G).

Instructional setting

Instructional sessions and NCB performance measures were conducted in a portion of a classroom within the unit for students with PI. Other teachers and students were present in adjacent areas of the classroom. The ST sat on one side of a 27 inch high table and the student sat on the other side, either in a straight-back chair or in the subject's wheelchair. A television and video cassette recorder were used to give the subjects feedback about their targeted NCB performance during simulated education conferences. The television was positioned so that the screen was visible only to the ST and the subject receiving instruction.

Subsequent Generalization (Phase Four)

The subsequent generalization phase consisted of both review and participation components. On the morning of the education conference with the classroom teachers, the student reviewed the NCBs learned during strategy instruction with the strategy trainer. Then the student participated in the conference using the appropriate newly acquired NCBs.

Social validation measures were obtained following the actual education conference. The student questionnaire was individually read to each subject and the subject marked a response of his/her choice for each question. After the actual education conference had been completed for all subjects, the teachers viewed the subjects videotapes of simulated education conferences and completed a teacher satisfaction questionnaire for each subject.

Experimental Design and Analysis

Experimental Design

A multiple baseline design across behaviors (MBDAB) (Tawney & Gast, 1984) was used to evaluate the effects of a metacognitive training procedure on the NCB performance of adolescents with PI. Three nonverbal communication conference behaviors were targeted for intervention with the training procedure. Training on the second NCB did not begin until NCB performance for the first behavior reached criterion during training sessions. Similarly, training on the third NCB did not begin until skill practice reached criterion on the second NCB.

The MBDAB was selected for several reasons. The NCBs targeted for instruction met the criteria outlined by Tawney and Gast (1984) for targeted behaviors: (a) a stable baseline was possible because the NCBs were functionally independent of one another and (b) the behaviors were similar enough to respond to the same intervention. The MBDAB has several advantages pertinent to the present investigation. First, return to baseline conditions

following intervention is not a necessary condition for demonstrating experimental control. Second, MBDAB allows for continuous monitoring of response generalization and maintenance. Finally, MBDAB provides an opportunity to replicate the effects of the intervention at least twice for each subject.

Data Display and Analysis

The percentage of observation intervals in which each student exhibited each target NCB was reported. Percentages for the NCBs were displayed on line graphs for each student. Data displayed graphically included a separate behavior targeted for instruction on each graph, consecutively presented on the page for each subject. A visual analysis (Tawney and Gast, 1984) of level, variability, and trend was made of the NCB skills demonstrated by each subject (N=5) during each condition of the intervention: baseline, instruction, concurrent generalization, and subsequent generalization.

Aspects of the data magnitude that were evaluated included level stability and level change. The criterion for level stability was the occurrence of 80% of the condition data points within a 15% range of the condition mean level. Level change within a condition and between adjacent conditions were reported.

The split-middle method was used to determine overall trend direction (accelerating, level, or decelerating). Criterion for trend stability was the occurrence of 80% of the condition data points within a 15% range of the trend line. The number of data

paths within a trend was noted as well as changes in trend direction and stability between conditions. Finally, the percentage of overlap of data point values between adjacent conditions was calculated.

A summary of the visual analysis for the baseline and concurrent generalization data plotted in line graphs was included for each subject. The summary was presented in a table and included the following information for (a) the length of baseline and concurrent generalization conditions; (b) the mean level within baseline and concurrent generalization condition (c) level stability, range, and percentage of overlap; (d) level changes within and between conditions; (e) trend direction and the number of data paths within the trend; and (f) trend stability.

Mean interobserver reliability data were reported for each subjects' nonverbal communication behaviors during simulated education conferences as well as for the personnel measures. The percentage of observation intervals in which the interviewer or teachers were speaking during the simulated and actual education conferences was displayed on a bar chart for all subjects. From this information a comparison was possible for the subjects' response opportunities in simulated and actual education conferences. The ratio of subject eye contact (while the interviewer was speaking) to the frequency of interviewer speaking

was converted to a percentage and displayed in a bar graph. The formula was

$$\text{\% Eye contact (EC) while interviewer is speaking (IS)} = \frac{EC + IS}{IS} \times 100.$$

Finally, the percentage of observation intervals in which each subject exhibited the newly acquired NCBs during the actual education conference was presented on a bar chart. Results of the investigation have been presented in Chapter IV.

CHAPTER IV
RESULTS

The results of the investigation of the effects of a metacognitive strategy, IMAGES, on the acquisition and generalization of nonverbal communication behaviors (NCBs) by adolescents with physical impairments (PI) have been presented in this chapter. Information about personnel performance measures have been presented first. Thereafter, the data pertaining to the measures of the subjects' NCB performances are evaluated. The research questions directly related to the acquisition and generalization of the NCBs have been addressed for each subject individually. Finally, the results relevant to the social validation measures have been included.

The subjects who were described in Chapter III have been referred to by their subject number (ie., S1, S2, S3, S4, and S5) throughout Chapter IV. Nonverbal communication behaviors have been referred to by the order in which they were introduced to the subjects for training purposes (ie., NCB1, NCB2, and NCB3).

Measurement Systems

Several types of data were obtained during the investigation: personnel performance measures, subject NCB measures, and social validation measures. Personnel performance measures were obtained

for the strategy trainer and the interviewers in order to monitor the consistency of the intervention and data collection conditions. Relevant performance behaviors for the strategy trainer included following the wording of the script provided in the IMAGES teacher's manual, following the sequencing of the script, using the materials correctly, and fluent pacing of the instruction. Performance behaviors for the interviewers included looking at the subject, smiling, following the scripted questions, and fluent pacing during the simulated education conference.

The subjects' performances of NCBs during structured conference situations were the dependent variables. The measures of the subjects' NCBs were obtained in three settings and in the presence of different individuals: (a) simulated education conferences with the interviewer; (b) strategy training sessions with the strategy trainer; and (c) actual education conferences with special education teachers. The subjects were adolescents who attended some of their classes in a program for students with PI. The physical impairments represented in the subject sample included myelomeningocele (S1), juvenile rheumatoid arthritis (S3), and cerebral palsy (S2, S4, and S5). The NCBs of interest in this investigation were sitting-up-straight, eye contact, smiling, head nods, forward lean, and position of arms and hands.

The social validation measures were obtained in order to assess the satisfaction of subjects and teachers with the strategy training procedures. The subjects and teachers responded to

questionnaire items about the importance, effectiveness, and practicality of the strategy training procedures.

Personnel Performance Measures

During the course of the investigation performance measures were obtained for the strategy trainer (ST) and the simulated education conference (SEC) interviewers. The criteria for evaluating personnel performance and formulas for percentages of appropriate behavior occurrences and interobserver reliability were presented in Chapter III.

Strategy Trainer

The performance results for the ST included the consistency of instructional time (see Table 5) and instructional behaviors (see Appendix K). During the course of the investigation 75 strategy training sessions were conducted--15 for each subject. In all but five sessions the amount of time spent for each step of instruction was consistent across all subjects (see Table 5). Exceptions were noted for S1, S2, and S4. Instructional time for S1 for the "model" step in Session 7 exceeded that of the other subjects. The instructional step "model" was one of the most complex instructional steps within the IMAGES strategy. Consequently, the initial presentation of "model" in Session 7 with S1 required more time than subsequent presentations. The increased instructional time for S2 in Sessions 13 and 14 was due to the subject's difficulty in readily demonstrating NCB1--sit-up-straight and NCB2--eye contact. Both of these NCBs required the

Table 5

Summary of Instructional and Personnel Conditions During Strategy Training and Simulated Education Conferences

	Session																
	1-4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Subject Training Sessions																	
Minutes	-	-	45	45[E]	20	45[F]	20	20	20	45[F]	20[G]	20	20	45	20	20[H]	20
Introduction	-	-	O&D*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NCB1	-	-	-	M	VR	P*	GP*	AP1*	AP2	-	-	-	-	-	-	-	-
NCB2	-	-	-	-	-	-	-	-	-	M-VR-P	GP	AP1	AP2*	-	-	-	-
NCB3	-	-	-	-	-	-	-	-	-	-	-	-	-	M-VR-P	GP	AP1	AP2*
Simulated Education Conferences (5 minutes each)																	
Interviewer	A	A*	A	A	A*	A	A*	A*	A	A	A	A*	A[a]	B*	B[a]*	A*	A

Note. See next page.

Table 5--Continued

Note. NCB: Nonverbal Communication Behavior	Strategy Training Steps	Subject Time
Exceptions		
A: Interviewer 1	O: Orient	E: S1--60+15 min
B: Interviewer 2	D: Describe	F: S2--55 min
A[a]: Subject 1,2,4,5 (I1); 3 (I2)	M: Model	G: S2--25 min
B[a]: Subject 2,4,5 (I2), 1,3 (I1)	VR: Verbal Rehearsal	H: S4--10+20 min
*: Strategy Trainer/Interviewer behaviors observed.	P: Prepare	
	GP: Guided Practice	
	AP: Advanced Practice (1 or 2)	

ST and subject to analyze the behavior components in order to determine a cue that was the most relevant for eliciting the desired behavior. For example, in order to sit-up-straight S2 had to keep her head and shoulders back. Her head position was the most critical component of the NCB because her shoulders and torso "followed" her head position in the anteroposterior plane. Therefore, her cue for sitting-up-straight was to think "head and shoulders". In order to maintain appropriate eye contact S2 had to keep her chin "level", and limit neck extension. Lastly, increased instructional time was necessary for S4 during an early morning instructional attempt (Session 19) because the subject was drowsy and inattentive. When the instructional session reconvened later the same morning the subject was alert and cooperative.

Relevant ST instructional behaviors were observed and recorded for 40% of the subject training sessions (see Table 5). The ST exhibited the instructional behaviors at or above the 80% performance criteria across subjects and sessions in all but one instance (see Table 6). During session 17 fluent pacing of instruction was at a 75% level for S1. Interobserver reliability measures were obtained for 27% of the subject training sessions (for four of the six formal performance observations). Interobserver reliability was 100% using total, occurrence, and nonoccurrence calculation methods.

Table 6

Percentage of Strategy Trainer Instructional Behaviors Exhibited Across Subjects and Sessions

Instructional Behavior	$\bar{X}$--%	Range--%
Following Script	99	88-100
Following Sequence	100	--
Fluent Pacing	98	75-100
Using Materials	99	88-100

Interviewers

During the course of the investigation 100 SECs were conducted--91 by the primary interviewer (I1). Relevant interviewer behaviors were observed and recorded throughout the investigation (see Table 5) for 27% of the total SECs. The interviewers' performance levels with each subject are presented in Table 7. Smiling was above the desired 50% level in all instances. Similarly, following the script and fluent pacing were greater than the desired 80% level in all instances. Looking at the subject was below the desired 80% level for three subjects for a total of four SECs. It should be noted that the interviewer was glancing at the script in preparation for the next interviewer question and that the interviewer's gaze was promptly redirected toward the subject. These instances of looking away from the subject were brief and

Table 7

Percentage of Appropriate Interviewer Behaviors Exhibited Across Sessions for Each Subject

Interviewer	Subject									
	S1		S2		S3		S4		S5	
	$\bar{X}$	Range	$\bar{X}$	Range	$\bar{X}$	Range	$\bar{X}$	Range	$\bar{X}$	Range
Looking at Subject	88	63-100	90	75-100	92	75-100	98	88-100	90	88-100
Smiling	90	75-100	96	88-100	86	50-100	70	50-100	78	50-100
Following Script	100	--	100	--	100	--	100	--	100	--
Fluent Pacing	100	--	100	--	100	--	100	--	100	--
# of Sessions		5		6		6		5		5

not necessarily inappropriate. Interobserver reliability measures were obtained for 19% of the total SECs and were 100% for total, occurrence, and nonoccurrence calculation methods.

Subject Nonverbal Communication Behavior Measures

A multiple baseline design across behaviors (Tawney & Gast, 1984) was used to evaluate the effects of a metacognitive training strategy, IMAGES, on the acquisition and generalization of NCBs by adolescents with PI. The dependent variables in the investigation were the NCBs exhibited by the subjects during baseline and concurrent generalization SECs, strategy training sessions, and actual education conferences (AECs). The specific NCBs of interest were sitting-up-straight, leaning forward, position of arms and hands, eye contact, smiling, and head nods. Of secondary interest was the amount of time that the interviewer or teacher was speaking during the conferences. The procedures for scoring the videotaped conference NCBs and the training session NCBs were presented in Chapter III. All behavior frequencies were converted to percentages. Data analysis parameters and formulas for calculating NCB percentages and interobserver reliability were included in Chapter III. In this chapter data have been displayed graphically and summaries of visual analyses have been presented in corresponding tables. Results pertaining to interobserver reliability and interviewer/teacher (I/T) speaking have been presented first. Next the research questions addressed by the

dependent variables have been stated. Lastly, the data analyses for each subject have been presented.

<u>Interobserver Reliability for SECs</u>

Interobserver reliability measures were obtained for 40% of the videotaped SECs for all subjects across baseline and concurrent generalization sessions. Interobserver reliability was 100% for all subjects and behaviors as determined by using total, occurrence, and nonoccurrence methods.

<u>Interviewer/Teachers Speaking</u>

The percent of observation intervals during videotaped conferences in which the I/Ts were speaking was of interest as an indicator of the opportunities that the subjects had to make verbal responses (see Figure 3). During the majority of the SECs (Sessions 1-20) the interviewer was speaking for less than 50% of the observation intervals. During the AEC (Session 21) the teachers were speaking for greater than 75% of the observation intervals (during the first 5 min of the conference) for all subjects. Additionally the nature of the questions differed during SECs and AECs. The interviewer primarily asked open-ended questions. The teachers asked primarily dichotomous questions which in some cases elicited subject head movements that were consistent with positive or negative responses.

Also of interest was whether some NCBs occurred more or less often as a function of the I/Ts speaking. Eye contact was the NCB that might have had the most relevance to the interviewer speaking

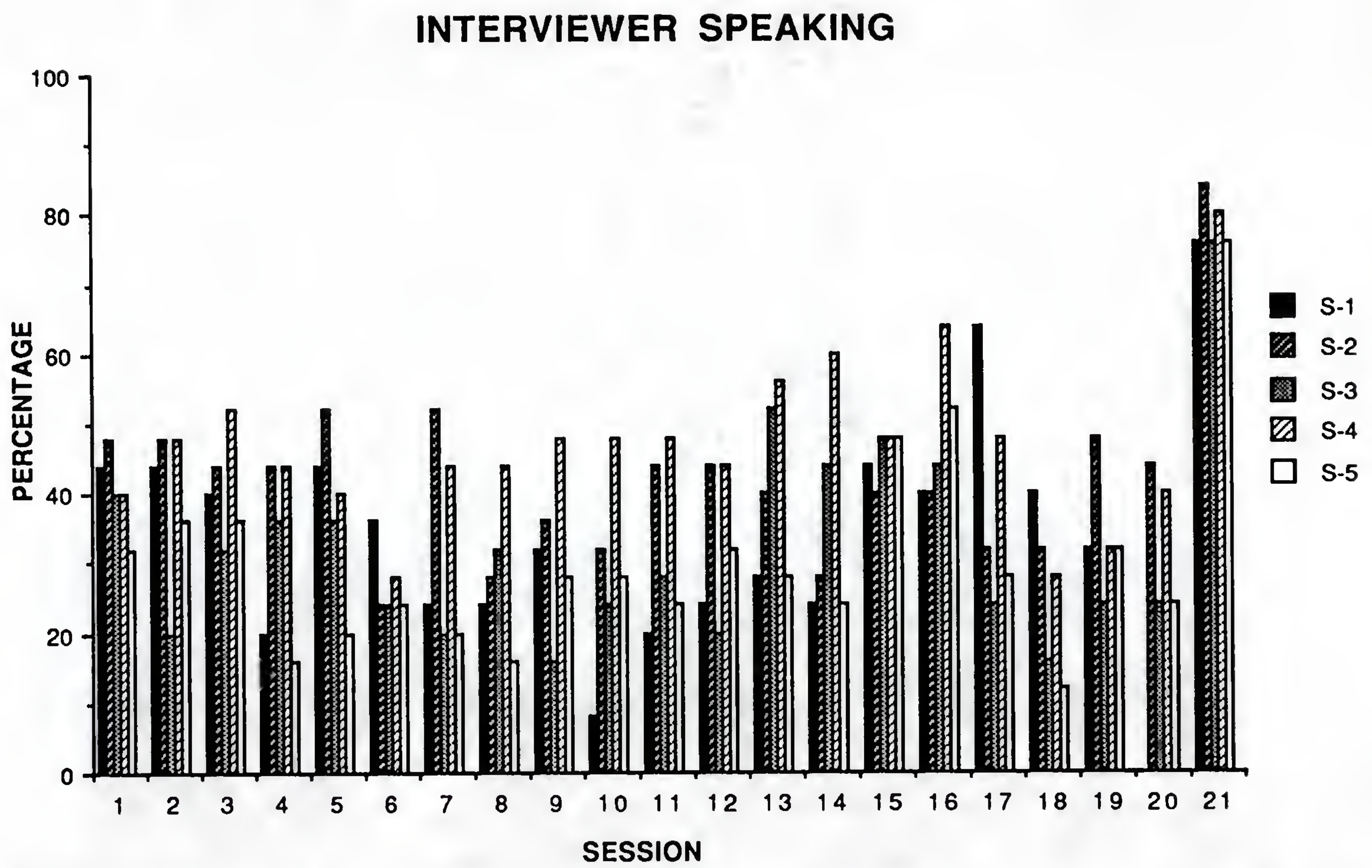


Figure 3. Percentage of session observation intervals in which the interviewer or teacher was speaking. (S: Subject. Sessions 1-20 were interviewer directed--5 min each. Session 21--first 5 min of conference--was teacher directed. Session 20--no data for S-1.)

(Kleck, Ono, & Hastorf, 1966). Based on visual inspection there was no readily apparent relationship between the occurrence of eye contact and I/Ts speaking until after eye contact reached a high percentage of occurrence following intervention (see Figure 4). In other words, once a high occurrence of eye contact had been established throughout the session, the ratio of eye contact (while the I/Ts were speaking) to the frequency of I/Ts speaking also increased. Similarly, functional relationships between the other NCBs and the occurrences of I/Ts speaking were not detected.

Research Questions

Three research questions were addressed in relation to each subject's performance of NCBs during baseline and concurrent generalization SECs, strategy training sessions, and the AEC.

Q1: What are the effects of training on the level of nonverbal communication behaviors exhibited by the subject during training sessions as compared to nonverbal behavior performances during baseline simulated education conferences?

Q2: What are the effects of training on the level, variability, and trend of nonverbal communication behaviors exhibited by the subject during baseline and concurrent generalization simulated education conferences?

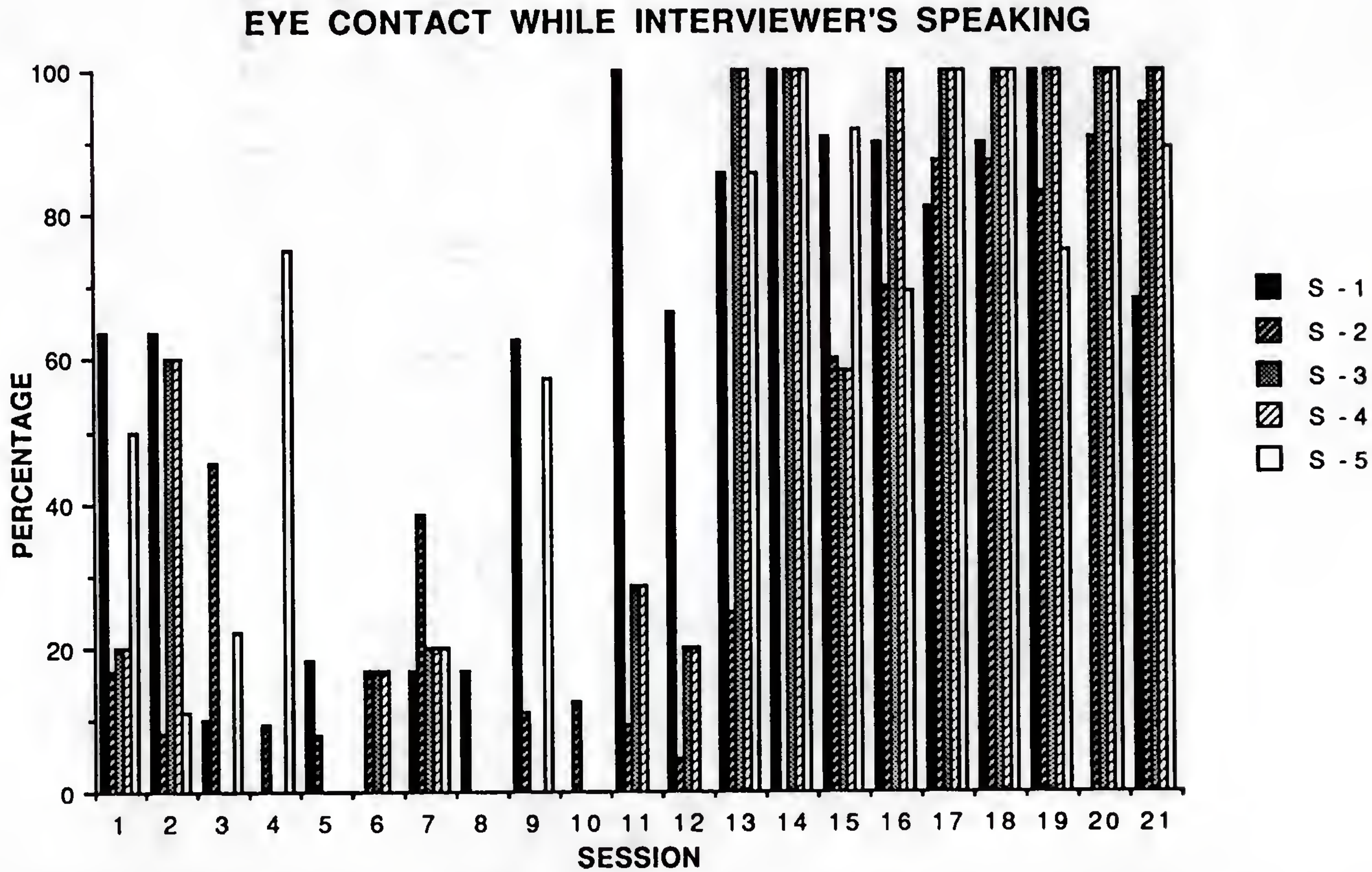


Figure 4. During interviewer speaking time, the percentage of the ratio of eye contact to the frequency of interviewer speaking. (S: Subject. Session 20-no data for S-1. In all other zero level sessions eye contact did not occur while the interviewer was speaking.)

Q3: Does the subject generalize the use of newly acquired nonverbal communication behaviors to an education conference attended by special education teachers who were not present during training sessions and simulated conferences?

The data for all NCBs are plotted on line graphs in Figure 5 and Figures 7-10 for S1-S5 respectively. Separate analyses of the data pertinent to the research questions were conducted for each subject separately. The data for each trained NCB were analyzed for level, stability, and trend across baseline, concurrent generalization, training, and subsequent generalization conditions. Summaries of the visual analyses of the baseline and concurrent generalization data plotted in Figure 5 and Figures 7-10 have been presented in Tables 8-12 for S1-S5 respectively. The subsequent generalization data were obtained during an actual education conference between each subject and two special education teachers. The AECs were variable in length. The data for the first 5 min of the AEC have been displayed on each subject's graphs (Figure 5 and Figures 7-10). Subsequent generalization data for all subjects' have been displayed for the entire AEC in Figure 6.

Subject One

During the initial baseline sessions (Sessions 1-6), S1 displayed nonverbal behaviors that were pertinent to the NCBs selected for strategy training. She sat either in a slumped

position with her shoulders rounded and her arms on the table or propped on her forearms with her shoulders elevated. She rarely sustained eye contact with the interviewer. She often looked at her hands or rolled her eyes upward and to the side. Her facial expression was passive and showed little emotion.

Subject 1 received strategy training for sitting-up-straight (NCB1), eye contact (NCB2), and head nods (NCB3). Sitting-up-straight and eye contact were first strategy training priorities for all subjects. For NCB3, head nods were chosen for S1 as a behavior that would convey responsiveness and interest to the interviewer. Baseline conditions continued for untrained NCBs for the duration of the investigation.

Data for all NCBs have been displayed graphically in Figure 5. Table 8 contains a summary of the visual analysis of baseline and concurrent generalization data for the trained NCBs. No data were available for the Session 20 SEC. The videotape of that session was erased before the NCBs were scored.

NCB1--sitting-up-straight (SUS)

Baseline versus training data. A positive change occurred in the percentage of SUS from baseline to strategy training conditions. During the first session in which training data were obtained (Session 10), more SUS was observed when compared to the last day of the baseline conditions (Session 6). There was no overlap in the data points between conditions. Subject 1

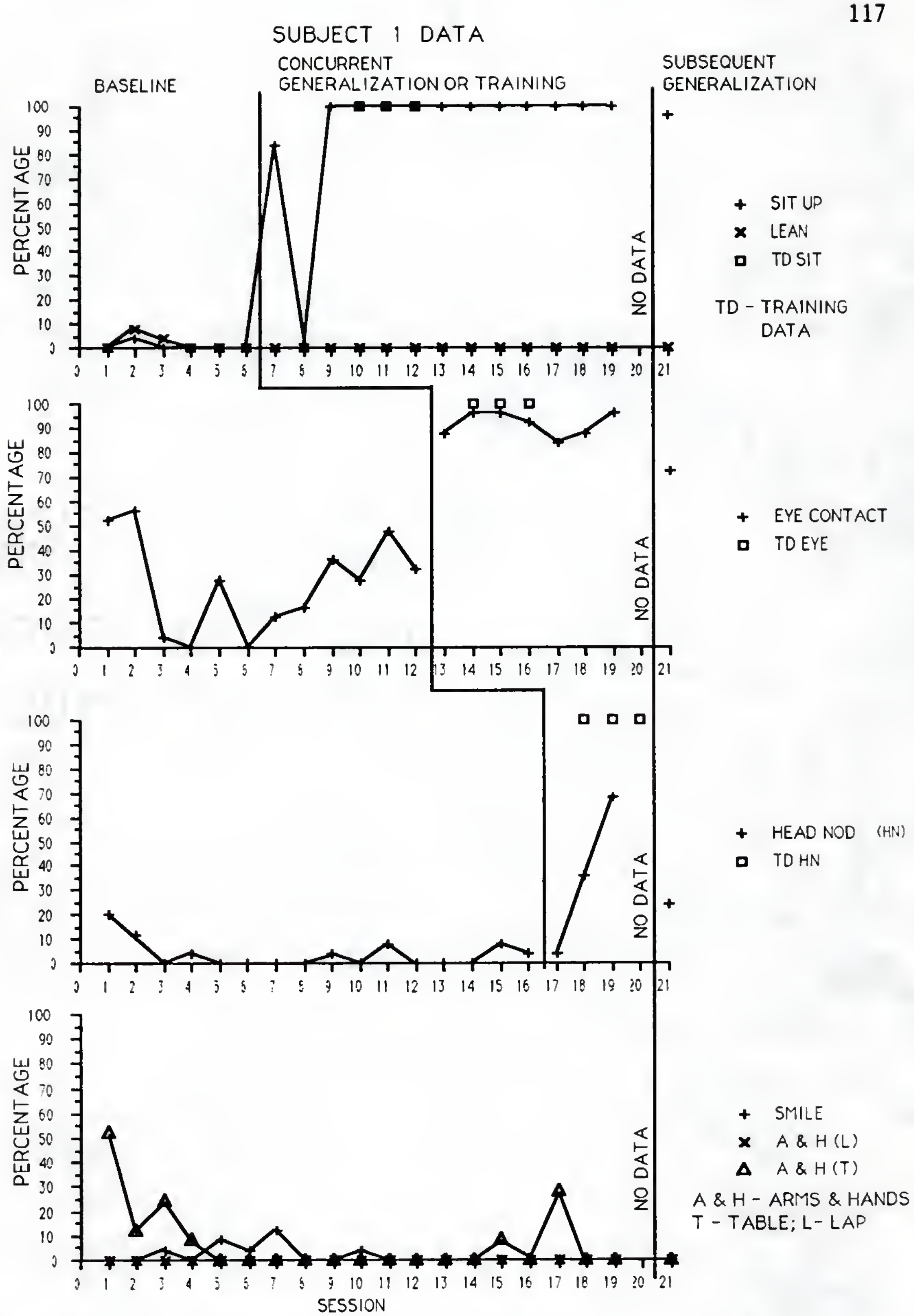


Figure 5. Percentage of 12 second intervals in which the nonverbal communication behaviors were observed for Subject 1. (All data are for 5 min sessions.)

Table 8

Summary of Visual Analysis of Baseline (BL) and Concurrent Generalization (CG) Data Plotted in Figure 5 for Subject 1 Nonverbal Communication Behaviors (NCBs)

	NCB1			NCB2			NCB3		
	Within Condition		Between Change	Within Condition		Between Change	Within Condition		Between Change
Analysis	BL	CG	BL/CG	BL	CG	BL/CG	BL	CG	BL/CG
Length (in sessions)	6	13	-	12	7	-	16	3	-
Mean ($\overline{x}$) Level	1	92	+91	26	91	+65	4	36	+32
Level Stability	S	S	none	V	S	V->S	S	V	S->V
& Range	0-4	0-100	8*	0-56	84-96	0*	0-20	4-68	33*
Level Change	0	+16	+84	-20	+8	+56	-16	+64	0
Trend Direction#	$(=)^1$	$(=)^4$	none	$(+)^2$	$(-)^2$	(+)->(-)	$(+)^2$	$(+)^1$	none
Trend Stability	S	S	none	V	S	V->S	V	S	V->S

Note. S: Stable; V: Variable; *: % of overlap; (+): Accelerating or positive; (-): Decelerating or negative; (=): Level or no change; #: Number of data paths in trend

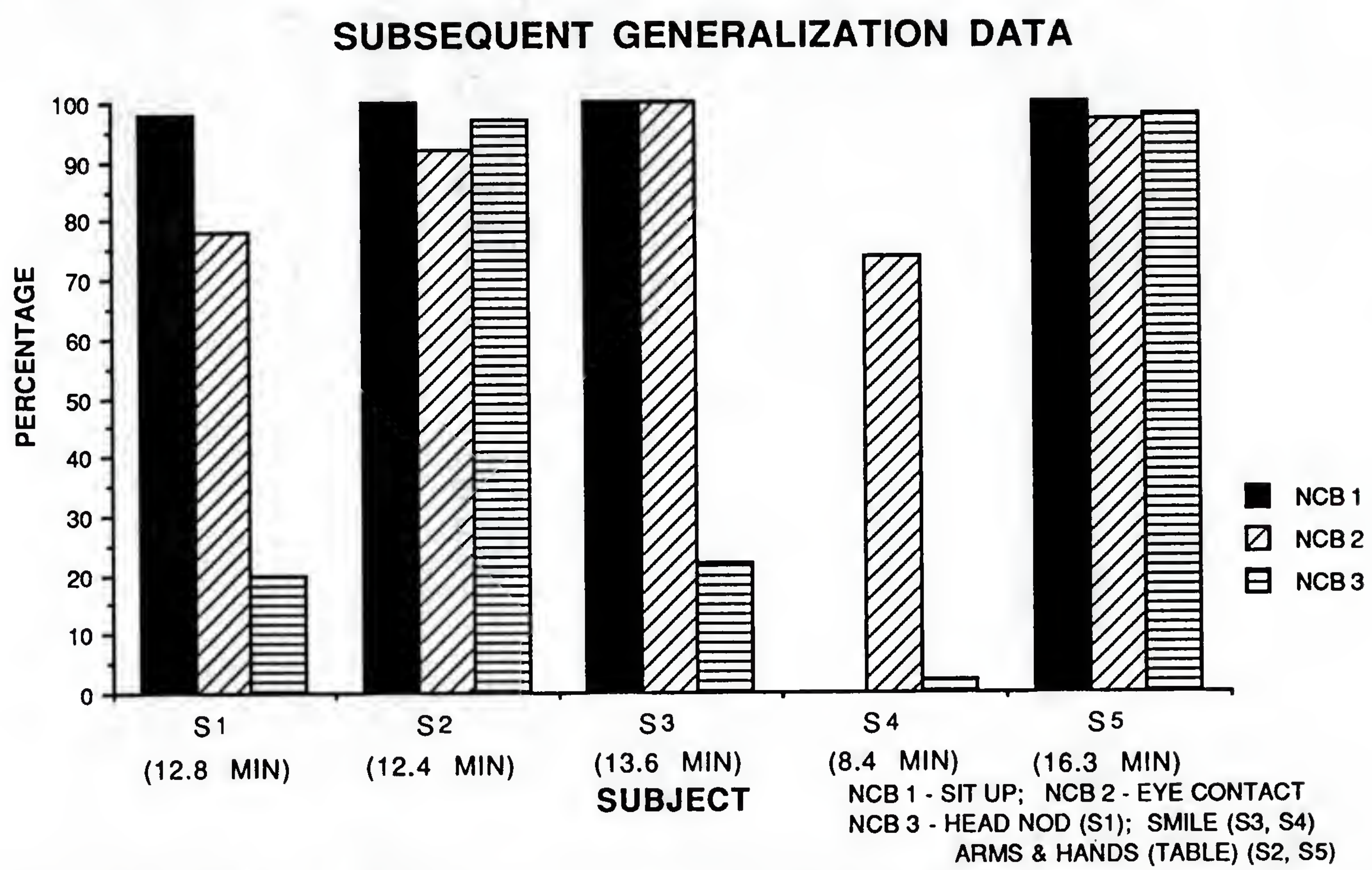


Figure 6. Percentage of actual education conference observation intervals in which nonverbal communication behaviors (NCBs) were exhibited by Subjects 1-5. (NCB1 was not exhibited by S4)

sat-up-straight for 100% of the observation intervals across all three training data sessions (Sessions 10-12).

Baseline versus concurrent generalization data. A positive change occurred in the percentage of SUS from baseline to concurrent generalization conditions. During the first session in which concurrent generalization data were obtained (Session 7), SUS was 84% greater when compared to the last session of the baseline condition (Session 6). This result was unexpected because although S1 was introduced to the behavior in Session 7 (see Table 5) she had not practiced nor received feedback on the behavior until Session 9. Subject 1 was the only subject for which modeling alone had an effect on SUS (see Figure 5 and Figures 7-10). Performance returned to baseline levels in Session 8 resulting in an 8% overlap in the data points between conditions. Session 8 was a verbal rehearsal session and neither modeling nor practice of NCB1 occurred. In Session 9 the subject viewed a videotaped segment of a baseline SEC. A limited amount of practice and feedback also occurred. The subject's SUS immediately rose to a 100% level during SECs and was maintained at that level for all remaining concurrent generalization sessions.

Subsequent generalization data. There was little change in the level of SUS between the concurrent generalization and the subsequent generalization conditions (see Figure 5). Moreover a high level of SUS was sustained for 12.8 min, the duration of the actual education conference (see Figure 6).

NCB2--eye contact (EC)

Baseline versus training data. A positive change was noted in the percentage of EC from baseline to strategy training conditions. The baseline trend was slightly accelerating. However, EC exceeded a 50% level only twice during 12 baseline sessions. During the first session in which training data was obtained (Session 14), 68% more EC was observed when compared to the last day of the baseline condition (Session 12). There was no overlap in the data points between conditions. Subject 1 made EC for 100% of the observation intervals across all three training data sessions (Sessions 14-16).

Baseline versus concurrent generalization data. Despite the slightly accelerating trend observed during baseline, a substantial positive change occurred in the percentage of EC from baseline to concurrent generalization conditions. During the first session in which concurrent generalization data were obtained (Session 13), EC was 56% greater when compared to the last session of the baseline condition (Session 12). There was no overlap in the data points between the conditions. Although the overall trend within the concurrent generalization condition was slightly decelerating, the last data path was accelerating. The level of EC was stable within concurrent generalization, varying between 84%-96%.

Subsequent generalization data. A negative change occurred in the percentage of EC from concurrent generalization to subsequent

generalization conditions (see Figure 5). However, the percentage of EC during subsequent generalization remained above baseline levels. Subject 1 sustained EC for greater than 75% of the observation intervals during the 12.8 min actual education conference (see Figure 6).

NCB3--head nods (HNs)

Baseline versus training data. A positive change occurred in the percentage of HNs from baseline to strategy training conditions. During the first session in which training data were obtained (Session 18), more HNs were observed when compared to the last day of the baseline condition (Session 16). There was no overlap in the data points between conditions. Subject 1 nodded her head at appropriate times for 100% of the observation intervals across all three training data sessions (Sessions 18-20).

Baseline versus concurrent generalization data. A delayed but positive change occurred in the percentage of HNs from baseline to concurrent generalization conditions. During the first session in which concurrent generalization data were obtained (Session 17), there was no change in the percentage of HNs when compared to the last day of the baseline condition (Session 16). There was a 33% overlap of data between the conditions. A steep accelerating trend was observed within the concurrent generalization condition with a 64% level change from the beginning to the end of concurrent generalization (Sessions 17-19).

Subsequent generalization data. A negative change occurred in the percentage of HNs from concurrent generalization to subsequent generalization conditions (see Figure 5). The level of HNs during the first 5 min of the AEC was higher than the 4% mean baseline level of HNs. Hns were observed during 20% of the observation intervals for the entire AEC (see Figure 6). The dichotomous nature of the teachers questions during the AEC may have influenced the subject's use of HNs. Subject 1 responded negatively to many of the dichotomous queries and was observed shaking her head from side to side in conjunction with her negative responses. Although HNs were taught as a behavior with which to communicate understanding--versus agreement--a HN response to negative information would have been a sophisticated NCB for a young adolescent. Under the circumstances a 20% level of HNs may not have been inappropriate. An alternative viewpoint was that the data for AEC HNs are uninterpretable due to the nature of the questions. When HN data during AECs for other subjects were examined (see Figure 5 and Figures 7-10), levels were above baseline levels for three of the four subjects. Inspection of the AEC videotapes revealed that S2, S3, and S4 had a high proportion of positive responses to the dichotomous queries. Head nods were noted in conjunction with the positive responses.

Summary

A visual analysis of the data for SUS, EC, and HNs was conducted. Notable increases in NCBs were not observed until after strategy training was implemented for each. Levels of untrained NCBs (ie., smiling, leaning forward, and positions of the arms and hands) remained virtually unchanged for the duration of the investigation. Strategy training was associated with positive changes during training sessions and concurrent generalization SECs for the three trained NCBs. Subject 1 generalized the use of SUS and EC to an actual education conference. Data for HNs during the AEC were confounded by the nature of the questions asked by the teachers. Following the final concurrent generalization session (Session 20--no data) the SEC interviewer noted that S1 was more responsive during Sessions 19 and 20 and through her actions was showing more understanding of the conference questions. The interviewer was unaware of the NCBs for which S1 had received strategy training. The interviewer's comments corresponded to an increase in recorded HNs following Session 19. Presumably, HNs above baseline levels may have occurred during Session 20.

Subject Two

During the initial baseline sessions (Sessions 1-6), S2 displayed nonverbal behaviors that were pertinent to the NCBs selected for strategy training. She sat in a slumped position with her shoulders rounded. She leaned on the table with her

arms. Hands were tense or moving in the air with elbows on the table. Her torso followed her head position. Total body control was better when her arms were in the midline of the body. She displayed some extraneous head movements in which she pulled her head to the side and back as if tossing her hair off of her face (except that her hair was not on her face). Hyperextension of the neck and concomitant chin elevation occurred intermittently. She displayed sidewards glancing at the interviewer but had little sustained eye contact. S2 smiled readily.

Subject 2 received strategy training for sitting-up-straight (NCB1), eye contact (NCB2), and position of arms and hands on the table (NCB3). Sitting-up-straight and eye contact were first strategy training priorities for all subjects. For NCB3, a relaxed arms and hands position (on table) was chosen for S2 as a behavior that would facilitate relaxation and a midline orientation. Baseline conditions continued for untrained NCBs for the duration of the investigation.

Data for all NCBs have been displayed graphically in Figure 7. Table 9 contains a summary of the visual analysis of baseline and concurrent generalization data for the trained NCBs.

NCB1--sitting-up-straight (SUS)

Baseline versus training data. A positive change occurred in the percentage of SUS from baseline to strategy training conditions. During the first session in which training data were obtained (Session 10), 86% more SUS was observed when compared to

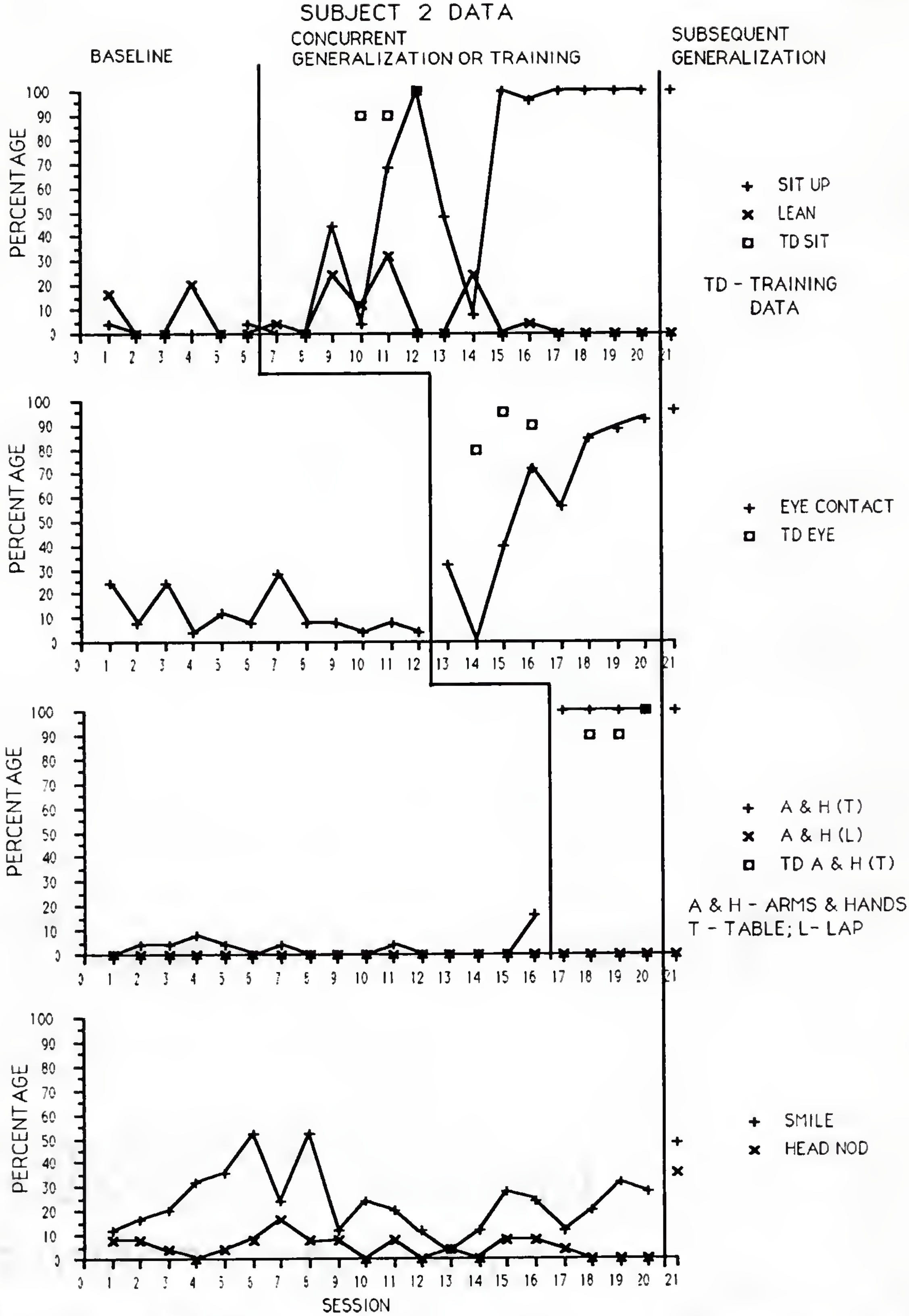


Figure 7. Percentage of 12 second intervals in which the nonverbal communication behaviors were observed for Subject 2. (All data are for 5 min sessions.)

Table 9

Summary of Visual Analysis of Baseline (BL) and Concurrent Generalization (CG) Data Plotted in Figure 7 for Subject 2 Nonverbal Communication Behaviors (NCBs)

	NCB1			NCB2			NCB3		
	Within Condition		Between Change	Within Condition		Between Change	Within Condition		Between Change
Analysis	BL	CG	BL/CG	BL	CG	BL/CG	BL	CG	BL/CG
Length (in sessions)	6	14	-	12	8	-	16	4	-
Mean ($\overline{x}$) Level	1	62	+61	12	58	+46	3	100	+97
Level Stability	S	V	S->V	V	V	none	S	S	none
& Range	0-4	0-100	21*	4-28	0-92	13*	0-16	100-100	0*
Level Change	0	+100	-4	-20	+60	+28	+16	0	+84
Trend Direction#	$(=)^1$	$(+)^4$	(=)->(+)	$(-)^1$	$(+)^1$	(-)->(+)	$(-)^1$	$(=)^1$	(-)->(=)
Trend Stability	S	V	S->V	V	V	none	S	S	none

Note. S: Stable; V: Variable; *: % of overlap; (+): Accelerating or positive;

(-): Decelerating or negative; (=): Level or no change; #: Number of data paths in trend

the last session of the baseline condition (Session 6). There was no overlap in the data points between conditions. The level of SUS was stable, ranging from 90%-100% across the three training data sessions (Sessions 10-12).

Baseline versus concurrent generalization data. A positive change occurred in the percentage of SUS from baseline to concurrent generalization conditions. During the first session in which concurrent generalization data were obtained (Session 7), the percentage of SUS remained at baseline levels. The overall trend within concurrent generalization was positive but variable with four data paths. During Sessions 9 and 10 some appropriate forward leans were observed in conjunction with SUS. During Sessions 13 and 14 the percentage of SUS dropped to 50% and 8% respectively, from a peak of 100% in Session 12. The decline in SUS concurrent generalization corresponded to the introduction of strategy training for NCB2 in Session 13. As noted in Table 5, S2 required more training time for NCB1 and NCB2 than the other subjects. A careful analysis of the behavior components were required for both NCB1 and NCB2 in order for S2 to perform the behaviors to criteria. There was a 21% overlap in the data points between conditions, with the level stabilizing at or above 96% beginning in Session 15 of concurrent generalization.

Subsequent generalization data. The level of SUS remained at 100% between the concurrent generalization and subsequent generalization conditions (see Figure 7). Moreover, S2 sat-up-

straight for 100% of the intervals in the 12.4 min actual education conference (see Figure 6).

NCB2--eye contact (EC)

Baseline versus training data. A positive change was noted in the percentage of EC from baseline to strategy training conditions. During the first session in which training data were obtained (Session 14), 76% more EC was observed when compared to the last session of the baseline conditions (Session 12). There was no overlap in the data points between conditions. Eye contact was maintained at the 80%-90% level across three training data sessions (Sessions 14-16).

Baseline versus concurrent generalization data. A positive change occurred in the percentage of EC from baseline to concurrent generalization conditions. During the first session in which concurrent generalization data were obtained (Session 13), EC was 28% greater when compared to the last session of the baseline condition (Session 12). There was a 13% overlap in the data points between conditions, with a stable accelerating trend during concurrent generalization. Beginning with Session 18, EC was maintained above the 85% level for the duration of the investigation.

Subsequent generalization data. Eye contact remained at a high level between the concurrent and subsequent generalization conditions (see Figure 7). Moveover EC was sustained for more

than 90% of the observation intervals during the 12.5 min actual education conference (see Figure 6).

NCB3--arms and hands on table (AH-T)

Baseline versus training data. A positive change occurred in the percentage of appropriate AH-T from baseline to strategy training conditions. During the first session in which training data were obtained (Session 18), 74% more AH-T was observed when compared to the last session of the baseline conditions. Subject 2 had appropriate AH-T for more than 90% of the observation intervals across the three training data sessions (Sessions 18-20).

Baseline versus concurrent generalization data. A positive change occurred in the percentage of AH-T from baseline to concurrent generalization conditions. During the first session in which concurrent generalization data were obtained (Session 17), AH-T was 84% greater when compared to the last session of the baseline condition (Session 16). There was no overlap in the data points between conditions. The occurrence of AH-T was at the 100% level for all concurrent generalization sessions (Sessions 17-20).

Subsequent generalization data. The level of AH-T remained at 100% between the concurrent generalization and subsequent generalization conditions (see Figure 7). Moreover, S2 exhibited AH-T for more than 95% of the observation intervals in the 12.4 min actual education conference (see Figure 6).

Summary

A visual analysis of the data for SUS, EC, and AH-T was conducted. Notable increases in NCBs were not observed until after strategy training was implemented for each. Levels of untrained NCBs (ie., leaning forward, smiling, and head nods) were unaffected by the strategy training for SUS, EC, and AH-T. Strategy training was associated with positive changes during training sessions, concurrent generalization SECs, and the subsequent generalization AEC for all three trained NCBs. The special education teachers noted that the subject seemed better in control of her body movements while seated and attributed the increase in control to the relaxed position of the arms and hands.

Subject Three

During the initial baseline sessions (Sessions 1-6), S3 displayed nonverbal behaviors that were pertinent to the NCBs selected for strategy training. He sat in a slumped position with shoulders rounded and chin slightly tucked. There were no extraneous movements of arms and hands. The subject's eyelids were somewhat droopy. He had limited eye contact with the interviewer, looking either down or away. He smiled infrequently and his facial expression was passive.

Subject 3 received strategy training for sitting-up-straight (NCB1), eye contact (NCB2), and smiling (NCB3). Sitting-up-straight and eye contact were the first training priorities for all subjects. For NCB3, smiling was chosen for S3 as a behavior

that would convey responsiveness and interest to the interviewer. Baseline conditions continued for untrained NCBs for the duration of the investigation.

Data for all NCBs have been displayed graphically in Figure 8. Table 10 contains a summary of the visual analysis of baseline and concurrent generalization data for the trained NCBs.

NCB1--sitting-up-straight (SUS).

Baseline versus training data. A positive change occurred in the percentage of SUS from baseline to strategy training conditions. During the first session in which training data were obtained (Session 10), 92% more SUS was observed when compared to the last session of the baseline condition (Session 6). There was no overlap in the data points between conditions. The level of SUS was maintained at 100% across the three training data sessions (Sessions 10-12).

Baseline versus concurrent generalization. A positive change occurred in the percentage of SUS from baseline to concurrent generalization conditions. During the first session in which concurrent generalization data were obtained (Session 7), the percentage of SUS remained at baseline levels. There was a 21% overlap in the data points between conditions. Beginning in the third session of concurrent generalization (Session 9), SUS accelerated to a level of 100% and was maintained at that level through Session 17. In Session 18 SUS decelerated to zero with a

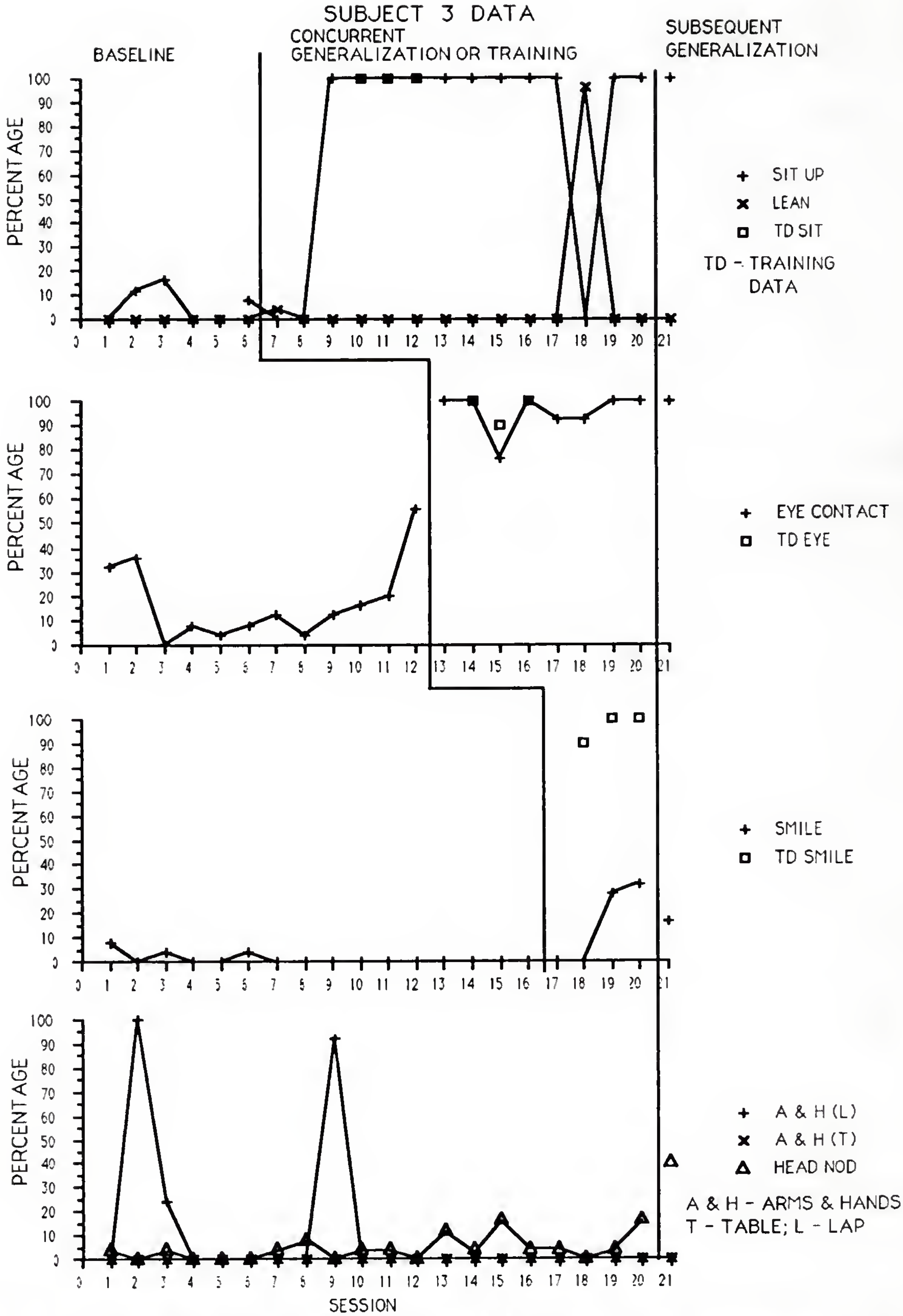


Figure 8. Percentage of 12 second intervals in which the nonverbal communication behaviors were observed for Subject 3. (All data are for 5 min sessions.)

Table 10

Summary of Visual Analysis of Baseline (BL) and Concurrent Generalization (CG) Data Plotted in Figure 8 for Subject 3 Nonverbal Communication Behaviors (NCBs)

	NCB1			NCB2			NCB3		
	Within Condition		Between Change	Within Condition		Between Change	Within Condition		Between Change
Analysis	BL	CG	BL/CG	BL	CG	BL/CG	BL	CG	BL/CG
Length (in sessions)	6	14	-	12	8	-	16	4	-
Mean ($\overline{x}$) Level	6	79	+73	17	96	+79	1	15	+14
Level Stability	V	V	none	V	S	V->S	S	V	S->V
& Range	0-16	0-100	21*	0-56	76-100	0*	0-8	0-32	50*
Level Change	+8	+100	-8	+24	0	+44	-8	+32	0
Trend Direction#	$(-)^1$	$(=)^5$	(-)->(=)	$(+)^3$	$(-)^1$	(+)->(-)	$(=)^1$	$(+)^2$	(=)->(+)
Trend Stability	V	V	none	V	S	V->S	S	V	S->V

Note. S: Stable; V: Variable; *: % of overlap; (+): Accelerating or positive; (-): Decelerating or negative; (=): Level or no change; #: Number of data paths in trend

concomitant rise in appropriate forward lean to a level of 96%. In Session 19 and 20 SUS returned to the 100% level.

Subsequent generalization data. The level of SUS remained at 100% between concurrent generalization and subsequent generalization conditions (see Figure 8). Moreover S3 sat-up-straight for 100% of the intervals in the 13.6 min actual education conference (see Figure 6).

NCB2--eye contact (EC).

Baseline versus training data. A positive change occurred in the percentage of EC from baseline to strategy training conditions. The baseline trend was variable and accelerating with three data paths. A relatively large increase occurred in the last session of the baseline condition (Session 12). Due to absences from school S3's training schedule was slightly behind that of the other subjects. On the day that S3 was receiving the final training session for SUS (Session 12) the other subjects were receiving training for EC. Subject 3 was in the room for portions of the other subject's training sessions and may have been exposed to EC training prematurely. Considering the length of the EC baseline, the possibility of more school absences for S3, and the below mastery performance of EC, a decision was made to begin EC strategy training with S3 in Session 13 despite the acceleration of EC in Session 12.

During the first session in which training data were obtained (Session 14), EC was 44% greater when compared to the last session

of the baseline condition. There was no overlap in the data points between conditions. Subject 3 had EC for 90%-100% of the observation intervals across the three training data sessions (Sessions 14-16).

Baseline versus concurrent generalization data. A positive change occurred in the percentage of EC from baseline to concurrent generalization conditions. During the first session in which concurrent generalization data were obtained (Session 13), the percentage of EC was 44% greater than when compared to the last session of the baseline condition (Session 12). There was no overlap in the data points between conditions. Beginning in Session 16 concurrent generalization EC was maintained above a 90% level for the remainder of the investigation.

Subsequent generalization data. Eye contact remained at 100% between the concurrent generalization and subsequent generalization conditions (see Figure 8). Moreover, EC was sustained for the entirety of the 13.6 min actual education conference (see Figure 6).

NCB3--smiling (SM)

Baseline versus training data. A positive change occurred in the percentage of SM from baseline to strategy training conditions. During the first session in which training data were obtained (Session 18), 90% more SM was observed when compared to the last session of the baseline condition (Session 16). There was no overlap in the data points between conditions. The level

of SM was stable and ranged from 90%-100% across the three training data sessions (Sessions 18-20).

Baseline versus concurrent generalization data. A slightly positive change was observed in the percentage of SM from baseline to concurrent generalization conditions. However, during the first two sessions in which concurrent generalization data were obtained (Sessions 17 and 18), SM remained at baseline levels. There was a 50% overlap in the data points between conditions with a final data path within concurrent generalization that was accelerating. Smiling was observed at a peak of 32% during the final session of the concurrent generalization condition (Session 20).

Subsequent generalization data. A negative change occurred in the percentage of SM from concurrent generalization to subsequent generalization conditions (see Figure 8). The 16% level of SM during the first 5 min of the AEC was higher than the 1% mean baseline level of SM. Subject 3 sustained SM for more than 20% of the 13.6 min actual education conference (see Figure 6).

Summary

A visual analysis of the data for SUS, EC, and SM was conducted. Notable increases in SUS and SM were not observed until after strategy training was implemented for each. An increase in EC that was observed prior to strategy training for EC was attributed to the subject's premature exposures to strategy training for EC. An extension of the baseline conditions might

have clarified whether the increase was spurious or whether acceleration would have continued. An evaluation of situations associated with training conditions resulted in the decision to begin EC training without further baseline measures.

Primarily, levels of untrained NCBs (ie., leaning forward, position of arms and hands, and head nods) were not affected by the strategy training for SUS, EC, and SM. The performance of appropriate forward leans above a mastery level during the concurrent generalization condition of SUS (Session 18) may have been a case of generalization to a related behavior. The components of SUS and forward lean are similar and only one instance of an appropriate forward lean had been previously observed (Session 7).

Concurrent and subsequent generalization of SM was limited. Subject 3 expressed concern during training sessions about the shape of his smile due to facial nerve damage on the left side. While responding to the satisfaction questionnaire (see Social Validation Measures in this chapter) S3 remarked that he was smiling more than previously and seemed pleased with the corresponding responses he was receiving from other individuals.

Strategy training was associated with positive changes of varying degree during the training sessions, concurrent generalization SECs, and the subsequent generalization AEC for all three trained NCBs. Following the final concurrent generalization session (Session 20) the SEC interviewer remarked that S3 was more

responsive during Sessions 19 and 20 and seemed to be enjoying the SEC more than during previous sessions. The interviewer was unaware of the NCBs for which S3 had received training. The interviewer's comments corresponded to the increase in S3's SM behavior during SECs in Sessions 19 and 20.

Subject Four

During the initial baseline sessions (Sessions 1-6), S4 displayed nonverbal behaviors that were pertinent to the NCBs selected for strategy training. He sat in a slumped position with his shoulders rounded and forearms on the table. S4 occasionally gestured appropriately with his unaffected arm. He also supported his chin with his unaffected hand or had his hand around his face. When in a natural and relaxed position his mouth was open and his chin appeared to recede. His facial expression was passive and he had limited eye contact with the interviewer.

Subject 4 received strategy training for sitting-up-straight (NCB1), eye contact (NCB2), and smiling (NCB3). Sitting-up-straight and eye contact were the first training priorities for all subjects. For NCB3 smiling was chosen for S4 as a behavior that would convey responsiveness and interest to the interviewer. Baseline conditions continued for untrained NCBs for the duration of the investigation.

Data for all NCBs have been displayed graphically in Figure 9. Table 11 contains a summary of the visual analysis of baseline and concurrent generalization data for the trained NCBs.

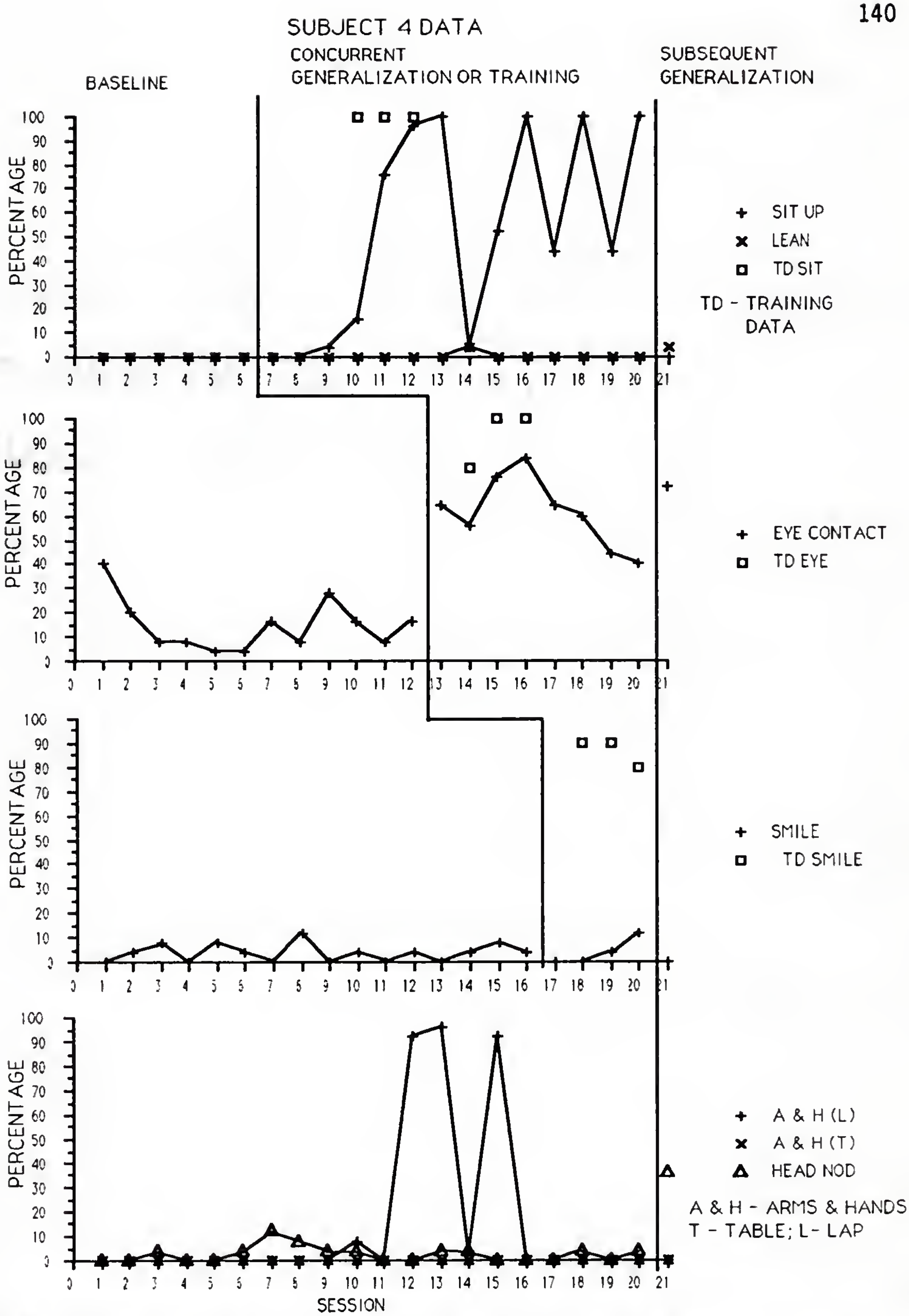


Figure 9. Percentage of 12 second intervals in which the nonverbal communication behaviors were observed for Subject 4. (All data are for 5 min sessions.)

Table 11

Summary of Visual Analysis of Baseline (BL) and Concurrent Generalization (CG) Data Plotted in Figure 9 for Subject 4 Nonverbal Communication Behaviors (NCBs)

	NCB1			NCB2			NCB3		
	Within Condition		Between Change	Within Condition		Between Change	Within Condition		Between Change
Analysis	BL	CG	BL/CG	BL	CG	BL/CG	BL	CG	BL/CG
Length (in sessions)	6	14	-	12	8	-	16	4	-
Mean ($\overline{x}$) Level	0	53	+53	15	61	+46	4	4	0
Level Stability	S	V	S->V	V	V	none	S	V	S->V
& Range	0-0	0-100	14^*	4-40	40-84	13^*	0-12	0-12	100^*
Level Change	0	+100	0	-24	-24	+48	+4	+12	-4
Trend Direction#	$(=)^1$	$(+)^5$	(=)->(+)	$(+)^2$	$(-)^2$	(+)->(-)	$(=)^1$	$(+)^1$	(=)->(+)
Trend Stability	S	V	S->V	V	V	none	S	S	none

Note. S: Stable; V: Variable; *: % of overlap; (+): Accelerating or positive; (-): Decelerating or negative; (=): Level or no change; #: Number of data paths in trend

NCB1--sitting-up-straight (SUS)

Baseline versus training data. A positive change occurred in the percentage of SUS from baseline to strategy training conditions. During the first session in which training data were obtained (Session 10), 100% more SUS was observed when compared to the last session of the baseline condition (Session 6). There was no overlap in the data points between conditions. The level of SUS during the three training data sessions was maintained at 100% (Sessions 10-12).

Baseline versus concurrent generalization data. A positive change occurred in the percentage of SUS from baseline to concurrent generalization conditions. During the first three sessions in which concurrent generalization data were obtained (Session 7-9), the percentage of SUS remained at baseline levels. The overall trend within concurrent generalization was positive but variable with five data paths. Neither level nor trend stability were obtained during concurrent generalization. There was a 14% overlap in the data points between conditions with performance during the final six sessions of concurrent generalization ranging from 44% to 100%.

Subsequent generalization data. The level of SUS returned to baseline levels during subsequent generalization for the first 5 min of the AEC (see Figure 9) and remained at zero for the duration of the 8.4 min actual education conference (see Figure 6).

NCB2--eye contact (EC)

Baseline versus training data. A positive change was observed in the percentage of EC from baseline to strategy training conditions. During the first session in which training data were obtained (Session 14), 64% more EC was observed when compared to the last session of the baseline conditions (Session 12). There was no overlap in the data points between conditions. The percentage of EC ranged from 80% to 100% during training data sessions (Sessions 14-16).

Baseline versus concurrent generalization data. A positive change occurred in the percentage of EC from baseline to concurrent generalization conditions. During the first session in which concurrent generalization data were obtained (Session 13), EC was 48% greater when compared to the last session of the baseline condition (Session 12). There was no overlap in the data points between conditions. However there were two data paths within concurrent generalization. The final trend was decelerating. The downward trend began during the session in which NCB3--smiling--was introduced.

Subsequent generalization data. Eye contact was at a higher level during the first 5 min of the AEC when compared with the last session of the concurrent generalization condition (see Figure 9). The percentage of EC during subsequent generalization was higher than the 61% mean EC during concurrent generalization.

Moreover, EC was sustained above a 70% level for the 8.4 min actual education conference (see Figure 6).

NCB3--smiling (SM)

Baseline versus training data. A positive change occurred in the percentage of SM from baseline to strategy training conditions. During the first session in which training data were obtained (Session 18), 96% more SM was observed when compared to the last session of the baseline condition (Session 16). There was no overlap in the data points between conditions. The level of SM was stable and ranged from 80%-90% across the three training data sessions (Sessions 18-20).

Baseline versus concurrent generalization data. There was no change observed in the percentage of SM from baseline to concurrent generalization conditions. The data overlap between the two conditions was 100%.

Subsequent generalization data. There were no occurrences of SM at the observation points during the first 5 min of the AEC (see Figure 9). Smiling occurred for less than 5% of the observations during the entire 8.4 min actual education conference (see Figure 6).

Summary

A visual analysis of the data for SUS, EC, and SM was conducted. Increases in NCBs were not observed until after strategy training was implemented for each. Consistent changes in the levels of untrained NCBs (ie., leaning forward, position of

arms and hands, and head nods) did not occur. Strategy training was associated with positive changes for the trained NCBs during training data sessions. The level of SM during concurrent generalization and subsequent generalization conditions did not increase over baseline levels. Subject 4 expressed self-consciousness about his appearance during training sessions and during responses to SEC questions. Although his smile was not unattractive, his front teeth were crooked and slightly protruding. Positive but variable changes were observed during concurrent generalization for SUS and EC. The baseline levels of SUS were observed during the subsequent generalization AEC. Eye contact was the only trained NCB that was observed at a high level during subsequent generalization.

Subject Five

During the initial baseline sessions (Sessions 1-6), S5 displayed nonverbal behaviors that were pertinent to the NCBs selected for strategy training. Usually S5 sat in a slumped position with her hips and buttocks pushed forward in the chair seat and scapulae touching the chair back. At other times she would slump forward and lean on the table. Her arms or elbows were usually on the table. She had little sustained eye contact with the interviewer but she smiled spontaneously. She fidgeted with her hands and they were often in front of her face.

Subject 5 received strategy training for sitting-up-straight (NCB1), eye contact (NCB2), and position of arms and hands on the

table (NCB3). Sitting-up-straight and eye contact were the first training priorities for all subjects. For NCB3, a relaxed position of arms and hands (table) was chosen for S5 as a behavior that would discourage fidgeting with her hands and facilitate relaxation. Baseline conditions continued for untrained NCBs for the duration of the investigation.

Data for all NCBs have been displayed graphically in Figure 10. Table 12 contains a summary of the visual analysis of baseline and concurrent generalization data for the trained NCBs. No data were available for EC during Session 11. Subject 5 wore her reading glasses to the SEC. Consequently, the scorers were unable to determine the direction of her eye gaze.

NCB1--sitting-up-straight (SUS).

Baseline versus training data. A positive change occurred in the percentage of SUS from baseline to strategy training conditions. During the first session in which training data were obtained (Session 10), 100% more SUS was observed when compared to the last session of the baseline condition (Session 6). There was no overlap in the data points between conditions. The level of SUS was maintained at 100% for the three training data sessions.

Baseline versus concurrent generalization data. A positive change occurred in the percentage of SUS from baseline to concurrent generalization conditions. During the first two sessions in which concurrent generalization data were obtained (Sessions 7 and 8), the percentage of SUS remained at baseline

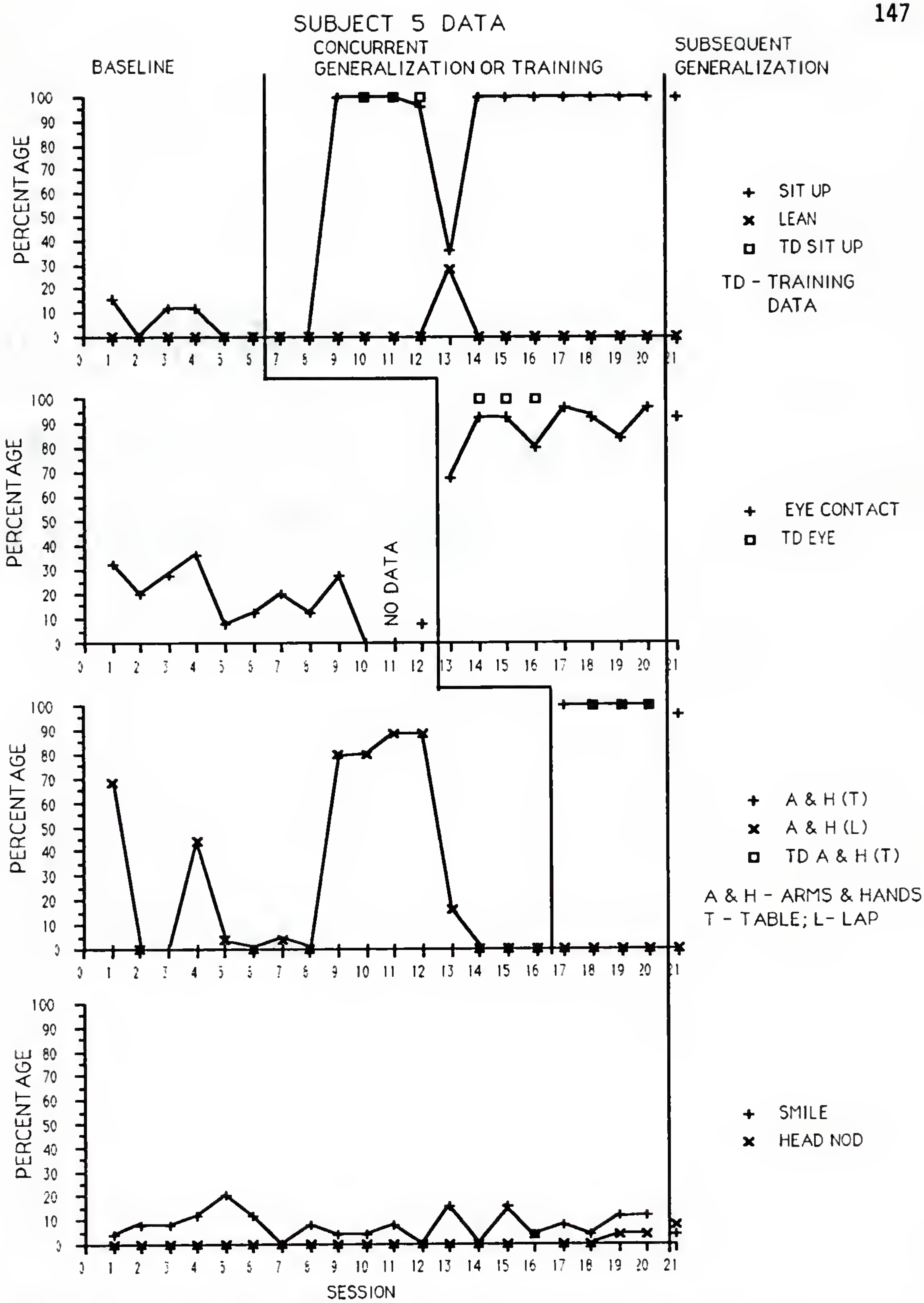


Figure 10. Percentage of 12 second intervals in which the nonverbal communication behaviors were observed for Subject 5. (All data are for 5 min sessions.)

Table 12

Summary of Visual Analysis of Baseline (BL) and Concurrent Generalization (CG) Data Plotted in Figure 10 for Subject 5 Nonverbal Communication Behaviors (NCBs)

	NCB1			NCB2			NCB3		
	Within Condition		Between Change	Within Condition		Between Change	Within Condition		Between Change
Analysis	BL	CG	BL/CG	BL	CG	BL/CG	BL	CG	BL/CG
Length (in sessions)	6	14	-	11	8	-	16	4	-
Mean ($\overline{x}$) Level	7	67	+60	19	86	+67	0	100	+100
Level Stability	V	V	none	V	V	none	S	S	none
& Range	0-16	0-100	14*	0-36	68-96	0*	0-0	100-100	0*
Level Change	0	100	+100	-24	+28	+60	0	0	+100
Trend Direction#	$(-)^1$	$(+)^4$	(-)->(+)	$(-)^1$	$(+)^1$	(-)->(+)	$(=)^1$	$(=)^1$	none
Trend Stability	V	V	none	V	V	none	S	S	none

Note. S: Stable; V: Variable; *: % of overlap; (+): Accelerating or positive;

(-): Decelerating or negative; (=): Level or no change; #: Number of data paths in trend

levels. The overall trend within concurrent generalization was positive. Beginning in Session 9, a 100% level of SUS was observed for all but one of the remaining sessions. In Session 13, corresponding to the introduction of strategy training for eye contact, the percentage of SUS decreased to 36% and forward lean increased to 28%. Session 13 was the only session in which forward lean was observed. There was a 14% overlap in the data points between conditions.

Subsequent generalization data. The level of SUS remained at 100% between the concurrent generalization and subsequent generalization conditions (see Figure 10). Moreover, S5 sat-up-straight for 100% of the intervals in the 16.3 min actual education conference (see Figure 6).

NCB2--eye contact (EC)

Baseline versus training data. A positive change occurred in the percentage of EC from baseline to strategy training conditions. During the first session in which training data were obtained (Session 14), 92% more EC was observed when compared to the last session of the baseline conditions (Session 12). There was no overlap in the data points between conditions. Eye contact was maintained at the 100% level across the three training data sessions.

Baseline versus concurrent generalization data. A positive change occurred in the percentage of EC from baseline to concurrent generalization conditions. During the first session in

which concurrent generalization data were obtained (Session 13), EC was 60% greater when compared to the last session of the baseline condition (Session 12). There was no overlap in the data points between conditions. The trend of EC was variable but accelerating during concurrent generalization. Eye contact was maintained above 80% for the last four sessions of concurrent generalization (Sessions 17-20).

Subsequent generalization data. Eye contact remained at a high level between the concurrent generalization and subsequent generalization conditions (see Figure 10). Moreover EC was greater than 95% for the duration of the 16.3 min actual education conference (see Figure 6).

NCB3--arms and hands on table (AH-T)

Baseline versus training data. A positive change occurred in the percentage of appropriate AH-T from baseline to strategy training conditions. During the first session in which training data were observed (Session 18), 100% more AH-T was observed when compared to the last session of the baseline condition (Session 16). There was no overlap in the data points between conditions. Subject 5 maintained appropriate AH-T for 100% of the observation intervals across the three training data sessions (Sessions 18-20).

Baseline versus concurrent generalization data. A positive change occurred in the percentage of AH-T from baseline to

concurrent generalization conditions. During the first session in which concurrent generalization data were obtained (Session 17), AH-T was 100% greater when compared to the last session of the baseline condition (Session 16). Arms and hands on table remained at the 100% level for all concurrent generalization sessions.

Subsequent generalization data. The percentage of AH-T remained at a high level between the concurrent generalization and subsequent generalization conditions (see Figure 10). Moreover AH-T was greater than 95% for the duration of the 16.3 min actual education conference (see Figure 6).

Summary

A visual analysis of the data for SUS, EC, and AH-T was conducted. Strategy training was associated with positive changes during training sessions, concurrent generalization SECs, and the subsequent generalization AEC for all three trained NCBs. Increases in the trained NCBs were not observed until after strategy training was implemented for each. Levels of untrained NCBs (ie., leaning forward, smiling, and head nods) were unaffected by the strategy training for SUS, EC, and AH-T.

However, a large increase in the percentage of the appropriate arms and hands in lap (AH-L) position occurred beginning in Session 9 when SUS first accelerated during concurrent generalization. In Session 13 AH-L returned to a low level and did not occur during the final three baseline sessions for the position of arms and hands (Sessions 14-16). During training

Session 9 for SUS the strategy trainer and S5 determined that S5 had been "lying" on the table during the baseline SECs. The strategy trainer jokingly remarked to the subject that it was impossible to lie on the table and to sit-up-straight at the same time. Subject 5's unprompted response to the strategy trainer's feedback was to place her hands in her lap.

Social Validation Measures

At the conclusion of the investigation subjects and their special education teachers expressed their opinions about the importance, effectiveness, and practicality of the IMAGES NCB acquisition strategy. The importance of the NCB acquisition strategy was assessed by asking the participants to rate the importance of NCB usage in education conferences and in classroom participation. Questions about improvements in the subjects' NCBs in various settings were used to evaluate perceptions of the effectiveness of the procedures. Indicators of satisfaction with the procedures were the subjects' and teachers expressed (a) intent to personally use the IMAGES strategy and (b) recommendations that other students learn the IMAGES strategy. Satisfaction with the procedures was used as an indicator of the practicality of the intervention. Procedures pertaining to the administration of the social validation measures were described in Chapter III. Satisfaction questionnaires were completed by all subjects (N=5). Each teacher (N=2) completed five satisfaction questionnaires--one for each subject.

Subject Satisfaction

Two research questions were addressed using responses from the subjects' satisfaction questionnaires:

Q4: Do the subjects report satisfaction with the newly acquired nonverbal communication behaviors?

Q5: Do the subjects report satisfaction with training procedures?

A summary of the responses to the subject satisfaction questionnaires is presented in Table 13.

The subjects verified the importance of NCBs for education conferences and classroom participation. Interestingly NCBs were viewed as slightly less important for classroom participation than for education conferences. The subjects perceptions of strategy effectiveness were primarily positive. All subjects thought that their NCBs had improved overall and all but one subject thought that their NCB performance in education conferences had definitely improved. Subject 4 indicated in questionnaire comments that although his NCB had improved some, he was not consistently using the NCBs that he had been taught. The results of SEC and AEC performances verify S4's perceptions of his NCBs (see Figure 9). The subjects' views about improved NCB performance in school were mostly positive. The subjects' views were variable with respect to their perceptions of friends and family recognition of NCB improvement. However, more than half of the subjects thought that other individuals had noticed their improved NCBs at least

Table 13

Summary of Subject (N=5) Satisfaction Responses

Question Content	Response DN	SP/N	DP
Nonverbal Communication Behavior Importance (NCB)			
Education conference	-	-	5
Classroom participation	-	3	2
Strategy Effectiveness (Improved NCBs)			
Global	-	-	5
Education conference	-	1	4
Classes	-	2	3
Improvement Recognized by:			
Teacher	-	1	4
Friends	2	1	2
Family	1	1	3
Satisfaction with Procedures			
Recommend for other students	-	1	4
Independent use - NCBs	-	1	4
Independent use - other physical skills	-	1	4
Instruction for use with other physical skills	1	-	4

Note. DP: Definitely positive response

SP/N: Slightly positive or neutral response

DN: Definitely negative response

somewhat. If subject reports about their NCB improvements in school, social, and home environments were true it could mean that the subjects were generalizing their use of NCBs to untrained settings, situations, and people. Finally, subject satisfaction with the procedures was high. Only S5 indicated a negative response for receiving instruction to use the IMAGES strategy with other physical skills but she qualified the response with the comment "for right now".

Teacher Satisfaction

Two research questions were addressed using responses from the teacher satisfaction questionnaires:

Q6: Do special education teachers report satisfaction with the student's nonverbal communication behavior performance during simulated education conferences after training?

Q7: Do special education teachers report satisfaction with the training procedures?

Summaries of the responses to the teacher satisfaction questionnaires are presented in Table 14 and Table 15.

The teachers verified the importance of NCBs for education conferences and classroom participation. Definite improvement in SEC performance of NCBs was noted in nine instances. Subject 4's NCBs were judged to have improved only "a little" during SECs. The teachers responses pertaining to general evidence of NCB improvement and NCB improvement during classes were primarily

Table 14

Summary of Teacher Satisfaction Responses

Question Content	Response		
	DN	SP/N	DP
Nonverbal Communication Behavior Importance (NCB) (Teachers=2)			
Education conference	-	-	2
Classroom participation	-	-	2
Strategy Effectiveness (Improved NCBs) (2 teachers' responses for 5 subjects)			
Global	-	5	5
Simulated education conference	-	1	9
Classes	1	5	4
Satisfaction with Procedures (Teachers=2)			
Recommend for other students	-	-	2
Would like to teach IMAGES - (Conference NCBs)	-	2	-
Would like to teach IMAGES - (Classroom NCBs)	-	1	1
Would like to teach IMAGES - (Other physical skills)	-	1	1

Note. DP: Definitely positive response

SP/N: Slightly positive or neutral response

DN: Definitely negative response

Table 15

Summary of Teacher (N=2) Satisfaction Responses for Improvements in Subjects' (N=5) Specific Nonverbal Communication Behaviors

	Subject				
Specific NCBs Improved	1	2	3	4	5
Facial Expression					
Eye Contact	2	2	2	2	2
Smiling	2	2	2	1	2
Head Nods	2	2	2	1	2
Physical Demeanor					
Sitting-Up-Straight	2	2	2	-	2
Forward Lean	2	2	2	-	2
Arms and Hands Position	2	2	2	1	2
Total	12	12	12	5	12

divided evenly between slightly positive and definitely positive responses. One teacher responded that S4 had definitely not shown any NCB improvement during classes. That the teachers detected any NCB improvements for subjects outside of education conferences indicated that some generalization of NCBs may have occurred for subjects across situations, settings, and people. The teachers reports were not interpreted as unequivocal evidence of generalization of NCBs to classroom participation because of potential biases. Data were not collected in the classroom and

the teachers were aware that NCBs were being trained. However, the responses may have been indicative of the teachers' awareness of the subjects' NCBs in the classroom and the potential for positive change of inappropriate NCBs.

Response tallies were indicative of mixed views about teachers' satisfaction with the strategy procedures. However, the teachers' comments reflected a primarily positive attitude toward the strategy procedures. One teacher responded "maybe" to three of the four procedure satisfaction questions. In her response explanation she stated that she would like for "someone" to teach her students the IMAGES strategy and that she would like to reinforce the behaviors during her classes. The concern seemed to be with an already full teaching curriculum. The teacher conceded that if there was no one else to teach the IMAGES strategy, she thought it was important enough to teach it herself. The other special education teacher was enthusiastic about teaching the IMAGES strategy for classroom participation NCBs and other physical skills. She was less enthusiastic about teaching conference NCBs. Her view was probably related to priorities for instruction. The subjects in this investigation had never previously attended an education conference, but daily experienced situations in regular and special education classes in which improved NCBs would be considered a performance asset. Both teachers stated that they would recommend that other students learn the IMAGES strategy to improve NCBs.

After watching videotaped conferences during baseline and concurrent generalization the teachers were also asked to indicate whether they noticed improvements in specific NCBs for each subject (see Table 15). For subjects S1, S2, S3, and S5 both teachers reported that improvements had occurred for all of the listed NCBs--trained and untrained. For S4 the teachers concurred that eye contact had improved but disagreed about improvements in smiling, head nods, and position of arms and hands. Neither teacher reported improvements in sitting-up-straight or forward lean for S4.

Summary

The purpose of this investigation was to evaluate the effects of a metacognitive strategy, IMAGES, on the acquisition and generalization of NCBs by adolescents with PI. Also of interest were the subjects' and teachers' perceptions about the effectiveness and practicality of the training procedures. The subjects (N=5) received training for using the IMAGES strategy to improve NCBs. The possible NCBs included sitting-up-straight, leaning forward, eye contact, smiling, head nods, and position of arms and hands. Each subject received strategy training for three NCBs. The NCBs were selected for inclusion in strategy training on the basis of the subject's performance of the NCBs during SECs prior to receiving instruction and performance priorities for the individual subjects.

Nonverbal Communication Behaviors

None of the subjects received training in leaning forward. Leaning forward had been included as a possible NCB in the event that baseline performances of sitting-up-straight were at high levels for some subjects. A forward lean would have been the next postural behavior introduced into the subjects NCB repertoire. If subjects had begun the investigation with high levels of sitting-up-straight, a forward lean would have been the next postural behavior introduced into the subject's NCB repertoire.

All subjects displayed low levels of sitting-up-straight and eye contact during the baseline condition SECs. Sitting-up-straight was the first NCB introduced to all subjects. Eye contact was the second NCB to receive training for all subjects. The third NCB varied across subjects. One subject received strategy training for head nods; two subjects received training for smiling; and two subjects received training for positions of the arms and hands.

The sequence of instruction for sitting-up-straight and eye contact was selected to address the possibility that the subjects' poor posture was contributing to their lack of eye contact. It was thought that improvements in posture might be accompanied by improvements in eye contact. However, eye contact did not change in relation to the increases in sitting-up-straight.

Similarly, eye contact was the second NCB introduced to all subjects in order to address the possibility that the subjects'

low levels of eye contact were contributing to low levels of smiling or head nods. It was thought that interactive or responsive behaviors (ie., smiling and head nods) might increase naturally if the subjects increased their eye contact with the interviewer (who was smiling). However, increased levels in eye contact were not accompanied by increases in interactive behaviors.

Research Questions

Three research questions addressed the effectiveness of the IMAGES strategy in terms of the subjects' acquisition and generalization of NCBs. In the first question, the effects of strategy training on the level of NCBs during training sessions as compared to baseline SECs were addressed. Following low levels of the targeted NCBs during baseline, all subjects exhibited high levels of NCB performances during training sessions in which data were collected. Training session NCB performances were stable for all subjects and ranged between 80%-100% performance levels. The results were the same for all three NCBs for each subject.

The second question pertained to concurrent generalization of the NCBs. The effects of strategy training on the level, variability, and trend of NCBs during SECs following instruction as compared to baseline SECs were addressed. Overall the effects of training on the concurrent generalization of NCBs were positive. In all instances except one (ie., NCB3 for Subject 4) there were positive changes in the level and/or trend of the NCB

performance in SECs after strategy training was implemented for the behavior. There were no distinct patterns observed in the stability of NCB performance across subjects and behaviors. However, high levels of performance were characteristic of most subjects during the final concurrent generalization sessions for sitting-up-straight (NCB1--same for all subjects) and eye contact (NCB2--same for all subjects). Concurrent generalization for the third NCB (NCB3--variable across the subjects) was not as consistent across subjects as concurrent generalization for NCB1 and NCB2.

The third research question pertained to subsequent generalization of the NCBs. The effects of strategy training on the generalization of newly acquired NCBs to an AEC attended by special education teachers was of interest. Of the three NCBs trained across five subjects (15 total NCBs) there were two instances in which the NCB was not generalized to the AEC, one case in which limited subsequent generalization occurred, and one case in which the results were confounded. Subject 4 did not generalize sitting-up-straight (which had been generalized variably to SECs) nor smiling (which had not been generalized to SECs) to the AEC. A high level of eye contact was exhibited by S4 during the AEC. The generalization of smiling (NCB3) to the AEC by S3 was limited although above baseline levels. Considering that S3 had demonstrated only moderate generalization of smiling to the SEC, the AEC results were acceptable. The generalization

of head nods (NCB3) by S1 to the AEC could not be validly determined because the questions that were asked by the teachers elicited positive or negative responses (and corresponding head movements) from the subjects.

The results of strategy training were primarily positive. All subjects exhibited mastery levels of the targeted NCBs during training data sessions and generalized their performance of sitting-up-straight and eye contact to SECs. Four subjects maintained high levels of sitting-up-straight and eye contact during AECs.

The generalization results for the third NCB were variable. Appropriate positions of the arms and hands were generalized to SECs and AECs by both of the trained subjects. Concurrent and subsequent generalization occurred on a limited basis for the interactive behaviors. One subject exhibited steady increases in head nods and one subject exhibited moderate gains in smiling behavior. However, one subject failed to generalize smiling to either SECs or the AEC.

The final four research questions addressed the satisfaction of subjects and teachers with the IMAGES strategy training. The results of the social validation measures were favorable. Subjects and teachers reported satisfaction with the newly acquired NCBs as well as the training procedures. Teacher ratings of NCB improvements for S4 were generally low especially in terms of generalization. Subject 4 responded that he had made limited

improvements in sitting-up-straight and smiling. However, he stated that his eye contact had improved. The teachers' evaluation of NCB generalization for S4 corresponded to his self-evaluations and somewhat to data from the videotaped conferences. However, it should be noted that concurrent generalization levels of sitting-up-straight and eye contact for S4 were well above baseline levels. Smiling was the only NCB that S4 failed to generalize at all.

In summary, after receiving training in a metacognitive procedure adolescents with PI improved and generalized their use of NCBs during training sessions and education conferences. The subjects and teachers reported satisfaction with the subjects' participation in the investigation and with the procedures used. Implications for these findings will be discussed in Chapter V.

CHAPTER V
DISCUSSION

The findings and implications for the investigation of a nonverbal communication training procedure for adolescents with physical impairments (PI) that incorporates motivational theory and metacognitive principles have been presented in this chapter. The chapter has been divided into five major sections. A review of the purpose, literature, and methods has been presented first. Second, a summary and analysis of results related to the research questions has been included. Discussion and implications of the research findings as related to adolescents with PI, instructional procedures, and generalization issues have been presented next. Fourth, limitations to the present research have been discussed. Finally, suggestions for future research have been presented.

Review of Purpose, Literature, and Methods

Review of Purpose

Two purposes were central to this investigation. The first purpose was to develop an individualized nonverbal communication training procedure for adolescents with PI that incorporates motivational theory and metacognitive principles. The second purpose was to evaluate the effectiveness of the procedure on the acquisition and generalization of nonverbal communication

behaviors (NCBs) by adolescents with PI. The satisfaction of students' and teachers' with newly acquired NCBs and with the training procedures was also of interest.

Review of Literature

Adolescents with PI exhibit a diverse range of physical, health, cognitive, communicative, sensory, and psychosocial abilities. In addition to academic skills, educational programming for students with PI must address self-esteem, activity level, mobility and independence, social role performance, competency and autonomy, and communication skills (Brunswick, 1985; Turnbull & Turnbull, 1985). Communication skills are one aspect of educational programming that may have a direct impact on other areas. Effective communication skills have been identified as a means for students to improve school experiences with teachers and peers (Schumaker & Hazel, 1984a, 1984b; Ellis, 1989), perceptions that others have about their performance capabilities (DeLoach & Greer, 1981), and self-advocacy outcomes (Van Reusen, 1985; Van Reusen, Bos, Schumaker, & Deshler, 1987).

Although effective communication skills are important for all individuals, persons with PI may be at an increased risk for difficulties in communicative interactions (Braithwaite, Emry, & Wiseman, 1984; Coker & Coker, 1985; DeLoach & Greer, 1981). Dysfunctional communication patterns have been reported to exist between individuals with PI and nonhandicapped (NH) individuals

(Comer & Piliavin, 1972; Kleck, 1968, 1969; Kleck, Ono, & Hastorf, 1966; Wiseman, Emry, Morgan, & Messamer, 1986). Persons with PI have been compared to apprehensive communicators who avoid social situations and communication interactions (Coker & Coker, 1985). Low self-esteem, diminished self-efficacy (Coker & Coker, 1985), movement and coordination irregularities associated with a physical impairment (DeLoach & Greer, 1981; Wiseman et al., 1986), and mutual misperceptions regarding communicative intent between individuals with PI and NH individuals (Braithwaite et al., 1984; Coker & Coker, 1985; Wiseman et al., 1986) have been associated with problematic patterns of communication for individuals with PI. Furthermore, persons with PI may not possess an adequate repertoire of communication skills that permits them to function flexibly across a variety of situational and contextual demands (DeLoach & Greer, 1981).

Communication consists of both verbal and nonverbal conversational behaviors (Coker & Coker, 1985; DeLoach & Greer, 1981; Fast, 1970; Wiseman et al., 1986). Nonverbal communication behaviors that have been identified as relevant to interpersonal interactions include: facial expressions, eye behavior, posture, and body movements (Coker & Coker, 1985; DeLoach & Greer, 1981; Fast, 1970; Knapp, 1972). Research on the nonverbal communication behaviors of individuals with PI is limited. Although, specific training in nonverbal communication skills has been advocated (Coker & Coker, 1985; DeLoach & Greer, 1981), NCB training of

students with PI and the potential impact of their unique characteristics on skill acquisition and generalization have not been reported.

Principles from motivation and metacognitive theories have been incorporated in NCB training procedures for students with learning disabilities (Ellis, 1989; Schumaker & Hazel, 1984a, 1984b; Van Reusen, 1985; Van Reusen et al., 1987). Motivation theorists have emphasized the importance of intrinsic motivation (ie., the need to feel competent and self-determining) in relation to children's learning and achievement (Adelman, 1978; Deci, 1975; Deci & Ryan, 1985; Wittrock, 1986). In this study metacognition was defined as an individual's knowledge and control over cognitive processes (Flavell, 1979; Reynolds & Wade, 1986). Procedures that incorporate motivation and metacognitive principles have been identified as a means of increasing students' situational performance, as well as the likelihood of transferring the learned behaviors to new situations. Such procedures have been consistent with educational goals of promoting individual autonomy in students with PI.

Review of Methods

Five adolescents with PI were included in this study. The students attended a middle school in which a program for students with PI was located. Although the subjects (S1-S5) were physically capable of performing the NCBs that were included in the investigation, they lacked consistent usage of appropriate

NCBs. One subject had an L3 level myelomeningocele and associated paralysis of her legs and feet. One subject had chronic juvenile rheumatoid arthritis. Three subjects had cerebral palsy and exhibited either: (a) quadriparetic ataxic spastic patterns with some athetotic movements, (b) hemiparesis, or (c) ataxia. Intellectual functioning of all subjects was within normal limits although levels of academic achievement were variable.

A multiple baseline design across behaviors was used to evaluate the effects of the use of a metacognitive strategy on the acquisition and generalization of NCBs by the subjects. The strategy consisted of steps in which the student used problem-solving behaviors to determine an individualized manner of performing the NCB based on personal physical abilities and the components of the skill (ie., NCB). The instructional procedures were divided into two stages of training for each NCB. The levels of the strategy instruction were: orient, describe, model, verbal rehearsal, and prepare. Skill practice consisted of guided practice and feedback, advanced practice and feedback, and generalization (Deshler & Schumaker, 1986, 1988).

The dependent variables were the subjects' performances of NCBs in three settings: simulated education conferences (SECs), strategy training sessions, and actual education conferences (AECs). Behavioral observation methods were used to record the occurrence of the NCBs including eye contact, smiling, head nods, sitting-up-straight, forward lean, and position of arms and hands.

The investigation was divided into four general phases: Phase One--personnel training; Phase Two--baseline condition and concurrent generalization; Phase Three--instructional intervention; Phase Four--subsequent generalization and social validation. Social validation consisted of subjects' and teachers' responses to satisfaction questionnaires.

Summary and Analysis of Results

Two types of research questions were investigated in this study. Three questions addressed the effectiveness of the IMAGES strategy in terms of the subjects' acquisition and generalization of NCBs. Four questions addressed the social validity of the IMAGES strategy.

In the first question, the effects of strategy training on the level of NCBs during training sessions as compared to baseline SECs were addressed. Following low levels of the targeted NCBs during baseline, all subjects exhibited high levels of NCB performances during training sessions in which data were collected.

The second question pertained to concurrent generalization of the NCBs. The effects of strategy training on the level, variability, and trend of NCBs during SECs following instruction as compared to baseline SECs were addressed. Overall the effects of training on the concurrent generalization of NCBs were positive. In all instances except one (ie., NCB3 for Subject 4) there were positive changes in the level and/or trend of the NCB

performance in SECs after strategy training was implemented for the behavior. Concurrent generalization for the third NCB was not as consistent across subjects as concurrent generalization for NCB1 and NCB2.

The results for NCB3 appeared to be related to the nature of the third behavior targeted for intervention. Position of arms and hands (table), a postural response, was generalized immediately for both subjects who received training. Nonverbal communication behaviors that had an interactive nature (smiling and head nods) were more resistant to generalization. However, some improvements in the trend were observed for smiling for S3 and for head nods for S1. The concurrent generalization condition was shorter for NCB3 than for NCB1 or NCB2. A longer condition may have evidenced additional improvement in NCB3 for S1 and S3. Subject 4 did not exhibit NCB3 (smiling) above baseline levels during concurrent generalization. Nevertheless, for most of the NCBs the effects of strategy training on concurrent generalization were positive.

The third research question pertained to subsequent generalization of the NCBs. The effects of strategy training on the generalization of newly acquired NCBs to an AEC attended by special education teachers was of interest. Of the three NCBs trained across five subjects (15 total NCBs) there were two instances in which the NCB was not generalized to the AEC, one case in which limited subsequent generalization occurred, and one

case in which the results were confounded. The remainder of the NCBs (11 total) for the subjects were maintained at levels commensurate with concurrent generalization levels. Overall, the effects of strategy training on subsequent generalization of NCB performances were positive.

The final four research questions addressed the satisfaction of subjects and teachers with the IMAGES strategy training. Subjects and teachers responded to questions about the importance of the strategy training, the effectiveness of strategy training for improving the subjects' NCBs, and satisfaction with the procedures. Responses by students and teachers were primarily positive with respect to strategy training importance, effectiveness, and practicality.

In summary, subsequent to training in the IMAGES strategy the subjects demonstrated acquisition of the targeted NCBs during strategy training sessions. Effects of strategy training were positive in relation to concurrent and subsequent generalization of the NCBs. Finally, as indicated by their questionnaire responses, subjects and teachers were satisfied with the IMAGES strategy training in terms of importance, effectiveness, and practicality.

Discussion and Implications

In this investigation an individualized nonverbal communication training procedure was developed for adolescents with PI that incorporates motivation and metacognitive principles.

The results of this investigation of the acquisition and generalization of NCBs have implications related to (a) adolescents with PI, (b) factors associated with NCB instruction, and (c) aspects of generalization.

Adolescents with Physical Impairments

First, the effectiveness of the training procedures have implications related to the NCBs of students with PI. The adolescents with PI who participated in this study were capable of benefitting from nonverbal communication training. The multiple baseline design across behaviors permitted the replication of positive results for three separate behaviors per subject. A total of five different behaviors were trained using the procedures. Although generalization of effects for interactive behaviors were less positive than for postural behaviors, the overall results were favorable. The external validity of the findings were substantiated through replication of the effects of NCB training for five subjects who displayed varying manifestations of PI in both type and degree. The procedures were flexible enough to address the subjects differential performance characteristics.

Second, the effectiveness of the training procedures used in this investigation has implications for the types of procedures used to teach adolescents with PI to improve their NCB performance. The procedures included metacognitive and motivational principles associated with enabling students to

become independent learners (Deshler & Schumaker, 1986, 1988). The advantages of teaching students with PI to use a metacognitive strategy in the acquisition of specific NCBs are twofold. First, the student learns a method that can be used to approach other NCBs. The student has the skills to become an independent learner across situations and settings. Second, as an independent learner the individual is exhibiting behaviors that are characteristic of self-determination (Deci, 1975; Deci & Ryan, 1985). Self-determination has been associated with intrinsic motivation and corresponding achievement oriented behaviors. Researchers have reported that some students with PI do not display locus of control orientations that have been associated with intrinsic motivation and self-determination. The use of metacognitive strategies in training programs for students with PI may promote intrinsic motivation as well as individual autonomy.

Strategy Instruction

Instructional considerations that are pertinent to NCB training procedures include the organization of the NCBs for presentation to the learner and the delivery of instruction. The findings of the current investigation have implications for the content and the sequence of presentation of the NCBs selected for strategy training. The outcomes of the present study have implications for instructional procedures that are relevant to NCB strategy training that are specific to the unique needs of youth with PI. Recommendations are made for practical aspects of

instruction and integrating the NCB strategy training procedure into existing instructional programs.

Organization of NCBs for presentation. In the present investigation in order to organize the NCBs for instruction, a task analysis was conducted for each NCB and the individual components were delineated. Subsequent to final data analyses, two observations were made about the content of the specific NCBs for presentation to students. These observations were evidence of the need for instructional procedures that allow for individualization based on the physical abilities of youth with PI.

First, the three subjects with cerebral palsy (S2, S4, and S5) evidenced temporary downward trends in NCB1 (sitting-up-straight) concurrent generalization performances that corresponded with the initial training sessions of the second NCB (eye contact). As increases were observed in NCB2 concurrent generalization performances, NCB1 performance accelerated and remained above baseline levels. Similar NCB1 performance decrements at the introduction of NCB2 were not observed for S1 nor S3. These performance data were interpreted as evidence that teaching NCBs simultaneously as a composite of skills may be problematic for some students with PI particularly in the presence of abnormal motor activity or tone.

Second, for two subjects (S4 and S5) high baseline levels of sitting-up-straight (NCB1) were observed during several sessions

in conjunction with high levels of arms and hands in lap (AH-L). The covariation of sitting-up-straight and AH-L was an indication that AH-L could have been taught in conjunction with sitting-up-straight. When subjects placed their arms and hands on the table, they leaned on their elbows for support and usually slumped their shoulders as well. While exhibiting AH-L, the subjects' temptation to lean on their elbows was removed. The possibility exists that some of the NCBs taught separately for measurement purposes were actually a related component of another NCB.

The sequence in which NCBs are presented for instruction is dependent on the initial performance competencies of the individual. In the present investigation, improving posture was deemed to be the most important NCB to train first, followed by eye contact. The students experienced performance improvements relatively quickly for both sitting-up-straight and eye contact. Interactive NCBs may take longer to reach proficiency in generalization settings. Training across sufficient exemplars (Stokes & Baer, 1977) may be necessary in order for generalization of interactive NCBs to occur. For youth with PI practice with and immediate feedback from additional persons in the training setting may facilitate the generalization of interactive NCBs.

Instructional procedures. Several of the NCB training components suggested by DeLoach and Greer (1981) were included in the IMAGES instructional procedures, including: the role of nonverbal communication behaviors in impression management;

examples and nonexamples of specific NCBs; situational role-playing practice using NCBs, including videotaping; feedback on the effectiveness of role-playing; and actual practice in real situations with follow-up critiques and discussion of outcomes. The procedures for improving NCB were effective in the present investigation.

Videotaping of the subjects' NCB performances was an integral component of this investigation. The subjects were able to view themselves and identify possible messages associated with their nonverbal behaviors. It was important for the students to be able to view themselves as others see them. Mirrors may be useful as an alternative medium of visual feedback. The advantage of mirrors would be that the feedback could be almost immediate and the student could make immediate adjustments. Mirrors have the potential disadvantage of requiring the student to "think, watch, and do" all at the same time. Videotapes are useful as permanent products that permit the student to see progress in their NCBs over time.

Training students with PI to improve nonverbal communication skills is relevant to educational goals in other areas of the curriculum (Bigge, 1982). Nonverbal communication training could be integrated into existing curriculum content for social, vocational, daily living, and/or life skills. Nonverbal communication behavior training may be consistent with goals of physical and/or occupational therapy for students with PI.

Lastly, the NCB training procedure could be used as a prerequisite for other areas of instruction that address NCBs (Ellis, 1989; Van Reusen et al., 1987) but do not include specific procedures for NCB training for students with PI.

Time constraints have been a serious consideration when adding curriculum components to the education program for students with PI. Often health management and therapy needs related to the physical impairment have placed time demands on the students' school schedules that reduce the time available for academics (Sirvis, 1988). In the present study the total time for acquisition and generalization of three NCBs was less than ten hours. For the second and third NCBs strategy implementation time was decreased by less than half of that required for NCB1. Despite initial increased time demands it would be advisable to deliver initial instruction over a relatively short time span and then implement maintenance activities for on-going application of the strategy to new behaviors that are related to other areas of the curriculum.

Generalization

Strategy usage. In this study the generalization measures for strategy usage were limited to concurrent generalization. Each subject used the strategy to facilitate skill analysis, acquisition, and generalization of three different NCBs. The students' application of the strategy to the NCBs required less direction from the strategy trainer with each successive NCB. The

IMAGES strategy is primarily an acquisition or preparation strategy. Evidence of the strategy usage was the performance of the NCBs. It is likely that the subjects could have applied the strategy to other NCBs with limited teacher guidance.

Nonverbal communication behavior performance. The nonverbal communication behaviors that were addressed by strategy application were generalized within a conference context across settings, people, and situations. Delayed feedback was given to subjects about their NCB performance for three SEC sessions per behavior. The feedback was given during the "prepare" step and prior to each advanced practice during strategy training. Furthermore, the students set goals to use the NCBs during education conferences. The feedback about SEC performances and goal setting may have facilitated the generalization of the newly acquired NCBs by establishing an expectancy for generalization (Stokes & Baer, 1977; Deshler & Schumaker, 1986, 1988). It is interesting to note that students also set goals to use the NCBs during their classes but did not receive classroom NCB feedback. Teachers stated that there was limited transfer of the NCBs to classroom participation (however, no data were collected). Feedback, verbal and visual, about performance in the generalization setting may be a necessary component if training procedures are to result in skill generalization.

Limitations

There were several limitations that may affect interpretations of the results of this investigation. First, students received NCB strategy training individually from the strategy trainer. Individual training was necessary in order to maintain experimental control of the introduction of new NCBs and to determine the unique physical and expressive needs of each child in order to exhibit the specific NCB. It is not known if the effects of NCB strategy training in groups would be the same. Furthermore, the subjects attended a program for students with PI within the same school. Each subject was aware that the other subjects were participating in the investigation. The amount of information sharing that may have occurred is not known.

Second, the only personnel in attendance at the actual education conference from which subsequent generalization data were obtained were the special education teachers within the program for students with PI at the school. The students had known the teachers for at least seven months. Scheduling difficulties precluded the inclusion of regular education teachers, parents, or other relevant personnel from attending the actual education conferences. The individualized education plans (IEPs) that were discussed with the students were being developed to use at IEP conferences at the beginning of the following school year. It is not known whether the subjects would have displayed similar NCBs in the presence of other personnel with whom they were less familiar.

Third, the subjects included in this investigation were all capable of performing the NCBs chosen for study. Due to the lack of previous research related to specific NCB training procedures that have been used with individuals with PI, it was necessary in this study to select subjects capable of performing the NCBs so that the effects of the training procedures could be evaluated. It is not known whether the IMAGES strategy training would be effective for individuals with more severe or multiple handicaps.

Suggestions for Future Research

Nonverbal communication behavior training is a promising area of research for improving the degree and quality of the interpersonal interactions of adolescents with PI. The incorporation of metacognitive and motivational principles into NCB training procedures is a means of facilitating the acquisition and generalization of NCBs and concurrently promoting individual autonomy for the adolescent with PI. Additional study in the area of nonverbal communication training procedures for individuals with PI that include principles from motivation and metacognition research will contribute to the knowledge base of providing effective programming that fosters independence.

Initially, researchers need to identify whether the sequence in which the NCBs are presented has an effect on the acquisition and generalization of NCBs. Related issues are whether the effects of training vary for interactive versus postural NCBs and whether different teaching and prompting strategies are needed for

youth with PI. Interactive NCBs may require additional considerations in the instructional process in order to optimize the likelihood of generalization across people and settings.

Second, the effects of group instruction on the effectiveness of the NCB strategy training needs to be addressed through research. Adolescents of any ability level are sensitive about their appearances and cognizant of ways in which they differ from their peers. Adolescents with PI may be reticent to evaluate their physical abilities honestly in the presence of others. In the present investigation the subjects were reluctant for other individuals (particularly peers) to view their videotaped performances from SECs. Even though NCB performance had improved dramatically, two of the five subjects did not want their parents to see their videotapes, because of the chance of increased parental scrutiny of their behaviors. Individual feedback and viewing of videotaped performances could be arranged within the group instruction format; however, the presence of peers during instruction of specific NCBs may cause some adolescents to feel inhibited about trying different postures, looks, and hand positions as required to normalize their NCBs.

Researchers need to investigate further generalization aspects of NCB training procedures. In the present investigation, introduction of new NCBs were based on training data performances. The effects of introducing new NCBs on the basis of concurrent generalization data would be of interest also. Generalization of

NCB strategy usage requires more research related to subsequent and independent generalization of the strategy steps, as well as adaptation of the strategy for application with other skills that involve the individual's physical abilities. Other types of physical skills appropriate for use with an adaptation of the strategy might include daily living, self-care, mobility, communicative, motor, recreation/leisure, and/or vocational skills (Bigge, 1982).

Finally, the effects of NCB strategy training and concomitant improvements in NCBs on interpersonal interactions should be investigated. Differential and often dysfunctional interaction patterns between individuals with PI and NH individuals have been reported in the literature. Prior to and subsequent to NCB strategy training, the identification and quantification of behavior patterns that characterize interactions between individuals with PI and NH individuals may provide more comprehensive information about the effectiveness of NCB strategy training.

Summary

In this investigation an individualized nonverbal communication training procedure was developed for adolescents with PI that incorporates motivation and metacognitive principles. The subjects received instruction related to enhancing their nonverbal communication during structured conference situations. The effects of the training procedure on the acquisition and

generalization of NCBs by adolescents with PI were positive. Subjects exhibited improvements in NCBs during training sessions and simulated education conferences. Moreover, the subjects transferred the use of newly acquired NCBs to an actual education conference attended by special education teachers who were not involved in the training process. The subjects generalized use of the IMAGES strategy across three NCBs. Furthermore, the procedure was socially valid. The subjects and teachers expressed satisfaction with the subjects' improved performance of NCBs and the training procedures.

The findings of this study have contributed to the knowledge base of providing programming that more effectively meets the unique needs of students with PI. Skills and processes that are necessary for individuals with PI to reach their potential for independent functioning and autonomy were addressed. The procedures investigated will be useful in helping adolescents with PI to become as normally interactive as possible and to increase NH persons comfort level in their mutual day-to-day interactions.

APPENDICES

APPENDIX A
INSTITUTIONAL REVIEW BOARD

UNIVERSITY OF FLORIDA
INSTITUTIONAL REVIEW BOARD
114 PSYCHOLOGY BUILDING
GAINESVILLE, FL 32611-2065
(904) - 392 - 0433

March 26, 1990

TO: Ms. Stephanie L. Freeman Carpenter
G315 NRN

FROM: C. Michael Levy, Chair,
University of Florida Institutional
Review Board

SUBJECT: Approval of Project #90.097
Self-advocacy for adolescents with physical impairments: nonverbal communication behaviors and metacognition

I am pleased to advise you that the University of Florida Institutional Review Board has recommended the approval of this project. The Board concluded that your subjects will not be placed at risk in this research, and it is essential that you obtain legally effective informed consent from each participant's parent or legal guardian. When it is feasible, you should obtain signatures from both parents.

If you wish to make any changes in this protocol, you must disclose your plans before you implement them so that the Board can assess their impact on your project. In addition, you must report to the Board any unexpected complications arising from the project which affect your subjects.

If you have not completed this project by March 26, 1991, please telephone our office (392-0433) and we will tell you how to obtain a renewal.

By a copy of this memorandum, your Chair is reminded of the importance of being fully informed about the status of all projects involving human subjects in your department, and for reviewing these projects as often as necessary to insure that each project is being conducted in the manner approved by this memorandum.

CML/her

cc: Vice President for Research   Unfunded
College Dean
R. Singer
Dr. Mary K. Dykes

APPENDIX B
PARENT AND STUDENT INFORMED CONSENT

PARENT INFORMATION LETTER

Dear Parents:

I am a doctoral student in Special Education at the University of Florida. As a part of my dissertation research I am studying nonverbal communication behaviors that are appropriate for use during job interviews or teacher conferences. Nonverbal communication behaviors include the messages that are sent by facial expressions and body movements or positions when a person is speaking . The purpose of my work is to determine whether students can learn to be better communicators during interviews and conferences. During the Students' training they will (1) identify their abilities in communication and (2) determine ways to perform nonverbal communication behaviors that will make a good impression on employers or teachers. It is believed that students who participate in this study will gain skills in communication that they will use throughout a lifetime.

Specifically, I am asking for your permission to (1) include your child in this project, (2) obtain achievement and other descriptive information from school records, and (3) videotape your child. All students, whose parents provide permission, will participate in mini-educational interviews for approximately 3 sessions prior to beginning instruction and on each day that instruction occurs. Each interview will take approximately 5 minutes. The students will be asked to respond to a variety of questions related to their experiences, performances, and goals in school. The students' communication skills, not answer content, will be observed and coded. The nonverbal communication skills that are selected for instruction will be determined for each student based on performance during the interviews.

All preinstruction interviews will be videotaped in order for the students to see their own communication skills. Other interviews may also be videotaped, especially after the child has been introduced to new skills in communication. With your permission videotapes may also be used in presentations of the results of the project and in teacher training. No child will be identified by their real name on the videotapes.

Once instruction begins the students will be asked to participate in daily instruction sessions. These sessions will last for 30 to 40 minutes and take place over a 3 to 4 week period. These sessions will take place while the students are in Mrs. Sider's classroom and will not otherwise affect the students' schedule or grades. A doctoral student in special education who has certification to teach special education will be training the students.

PARENT INFORMATION LETTER (Continued)

Participation in this project is in cooperation with Mrs. Siders. All information will be held in the strictest confidence. No names will be recorded and subjects will be referred to by number in all written reports.

If you have any questions about any aspect of this project, please call or write to Stephanie Carpenter, 10213 NW 6th Place, Gainesville, FL 32607; Phone 332-9050.

Sincerely,

Stephanie L. Carpenter
Principal Investigator

PARENT PERMISSION FORM

A.

I give permission (1) for my child, ____________________________, to participate as a volunteer in the study of communication skill development; (2) for achievement scores and descriptive information to be obtained from my child's school records for use in the study; and (3) for my child to be videotaped for use during the study.

YES_____ NO_____

B.

I give my permission for the videotapes of my child to be kept by the Principle Investigator and/or the University of Florida, Department of Special Education after the project ends so that they may be used in presentations about the project results and for teacher training purposes.

YES_____ NO_____

**If "NO" is marked on item "B" the videotapes will be destroyed at the conclusion of the project. The videotapes will only be used during the project so that the child may see their communication skills and for scoring purposes.

C.

I have read and I understand the description of my child's participation in the project named above and have received a copy of this description. I understand that all information will remain confidential with respect to the identity of my child. I understand that I may withdraw my consent for my child's participation in the above named project at any time I wish.

YES_____ NO_____

______________________________ (Parent/Guardian) __________ (Date)

______________________________ (Second Parent) __________ (Date)

SUBJECT CONSENT FORM

Subject Name ______________________________________ Date ________

Classroom Teacher ____________________ School____________________

A. My teacher has explained to me that I have the opportunity to learn communication skills that will help me during job interviews and during conferences with my teachers. I would like to participate in this learning project. I understand that observers will be watching me participate in interview sessions so that my communication skills can be evaluated and that the sessions will be videotaped. Also, my identity will be kept confidential and a number will be used in all permanent records instead of my name.

YES_____ NO_____

B. Nonverbal communication behaviors are facial expressions and body movements or positions that send messages to people when we are talking. I want to learn nonverbal communication skills that can help me communicate with others more effectively.

YES_____ NO_____

C. I give my permission for the videotapes of my interview performances to be viewed by my parents when this project is over.

YES_____ NO_____

D. I give my permission for the videotapes of my interview performances to be kept by the Principal Investigator and/or the University of Florida, Department of Special Education after the project ends so that they may be used in presentations about the project results and for teacher training purposes.

YES_____ NO_____

**If "NO" is marked on item "B" the videotapes will be destroyed at the conclusion of the project. The videotapes will only be used during the project so that you may see your communication skills and for scoring purposes.

____ ____________
(Student Signature) (Date)

____ ____________
(Classroom Teacher Signature) (Date)

____ ____________
(Principal Investigator Signature) (Date)
Stephanie L. Carpenter

APPENDIX C
STUDENT MATERIALS

STRATEGY OVERVIEW SHEETS

IMAGES (Steps)

I	Inventory your physical abilities.
M	Make a note of skill requirements.
A	Ask if there are differences.
G	Gather ideas for doing the skill.
E	Evaluate your performance.
S	Set goals to use the skill.

Note. Student Steps 4 & 5; Teacher Steps 2 & 3

IMAGES (PROCEDURES)

I Inventory your physical abilities.

1. Answer the questions on the Physical Abilities Questionnaire.
2. Write the things you can do well on the Inventory of Physical Abilities under "Strengths."

M Make a note of skill requirements.

1. Write the name of the nonverbal communication behavior (NCB) on the Worksheet--Nonverbal Communication Skills beside "Skill".
2. On the Worksheet--Nonverbal Communication Skills (Part A.) list the parts of the nonverbal communication behavior from the behavior IMAGES Information Sheet.

A Ask if there are differences.

1. Compare the skill requirements, or definition to your "strengths" that you listed on your Inventory of Physical Abilities.
2. Are there any differences between your abilities and the skills needed to perform the nonverbal behavior? (Answer questions B, C, D on the Worksheet--Nonverbal Communication Skills)

G Gather ideas for doing the skill.

1. If there are not any differences between your abilities and the skill requirements:

IMAGES (PROCEDURES) Continued

a) Are there any other reasons that you are not able to perform the nonverbal skill?

b) What will you need to do to perform the nonverbal behavior? Write instructions on the Worksheet--Nonverbal Communication Skills (Part E).

c) Make a cue card using Cue Cards for "G"--Gather ideas for doing the skill.

2. If there are differences between your abilities and the skill requirements:

   a) Are there any parts of the skill requirements that you can do? Write the parts of the nonverbal skill that you can do on your Worksheet--Nonverbal Communication Skills.

   b) What can you do instead of the skill parts that are outside of your ability? Write instructions on the Worksheet--Nonverbal Communication Skills (Part E).

   c) Make a cue card using Cue Cards for "G"--Gather ideas for doing the skill.

E Evaluate your performance.

1. Use Education Conference Role Play Cards (Each student should practice with three to five cards).

2. When the teacher asks you a question, answer the question using the skill listed on your Worksheet--Nonverbal Communication Skills.

IMAGES (PROCEDURES) Continued

3. Can you perform the nonverbal behavior following the instructions on your Worksheet--Nonverbal Communication Skills?

   a) If you can go on to the next Step "S".

   b) If you cannot, go back to Step "G" and write new instructions for the behavior on the Worksheet--Nonverbal Communication Skills.

S Set goals to use the skill.

1. On your Goal Sheet under "Skills to Improve or Modify" write the name of the nonverbal skill.

2. Under "Goals" write a goal to use the nonverbal communication behavior in education conferences.

3. Are there other places where the nonverbal behavior would be useful? If so, write a goal.

NONVERBAL COMMUNICATION BEHAVIORS (NCBs)

SIT UP STRAIGHT

RELAX HANDS AND ARMS

LEAN FORWARD

SMILE

EYE CONTACT

NOD YOUR HEAD

Note. Student Step 5; Teacher Steps 2 & 3

DEFINITIONS OF NONVERBAL COMMUNICATION BEHAVIORS (ALL)

1. Sit up straight:
   a. Hips and buttocks pushed back in chair seat.
   b. Torso is straight.
   c. Hips and torso are positioned so that there is approximately a 90 degree angle.
   d. Shoulders are parallel to hips.
   e. Shoulders are not hunched or rounded.
   f. Shoulders blades touch the chair back.
   g. Head is straight up or slightly tilted.
   h. Head is positioned over shoulders.
2. Relax hands and arms:
   a. Arms are unfolded.
   b. Upper arms are hanging down or reaching forward. No more than 45 degree shoulder flexion.
   c. Elbows are slightly flexed between approximately 45 and 135 degrees and not on the table.
   d. Palms are slightly extended and facing up with fingers relaxed or palms are facing each other with fingers slightly touching.
   e. Hands are resting on table or in lap.

      or
   f. Hands are in lap.

DEFINITIONS OF NONVERBAL COMMUNICATION BEHAVIORS (ALL)

(Continued)

3. <u>Lean forward:</u> Same as sitting-up-straight except:

   a. Shoulders are slightly forward--not touching back of chair.

   b. Waist is away from chair back.

   c. Forward slant is not more than 45 degrees <u>or</u>

   d. Sitting toward front edge of chair <u>and</u>

   e. No part of back and shoulders is touching the chair back.

4. <u>Smile:</u>

   a. Corners of mouth are pulled slightly back but lips are together <u>or</u>

   b. Corners of the mouth are pulled back and the upper lip exposes portions of the teeth.

5. <u>Eye contact:</u>

   a. Keep head in midline.

   b. Chin level.

   c. Open eyes.

   d. Look at the interviewer.

6. <u>Nod your head:</u>

   a. Head moves up and then down.

   b. May be one quick nod.

   c. May be slow and repeated several times.

   d. May be several quick nods.

   e. When the other person is speaking or immediately after the other person stops speaking.

STUDENT WORKSHEETS

PHYSICAL ABILITIES QUESTIONNAIRE

Directions: Check the things you think you can do. Write the underlined words on your inventory.

Part 1. <u>Posture</u> Can you:

<u>Lower extremities</u>

1. Keep your <u>feet</u> flat <u>on</u> the <u>floor</u>?
2. Sit with <u>hips</u> all the way to the back of a seat?
3. Keep your <u>feet</u> <u>still</u>?
4. Keep your <u>legs</u> <u>still</u>?
5. Do all of the above? (<u>Feet, legs, hips--all</u>)

<u>Back and Shoulders</u>

1. Keep your <u>back straight</u> up when sitting in a chair?
2. Keep your <u>shoulders</u> against the chair <u>back</u>?
3. <u>Relax</u> your <u>shoulders</u>?
4. <u>Raise</u> your <u>shoulders</u>?
5. <u>Lean forward</u> slightly while sitting in a chair (so that you are sitting up but your back is not touching the chair back)?
6. Do all of the above? (<u>Back and shoulders--all</u>)

<u>Note</u>. Student Step 3; Teacher Steps 2 & 3.

PHYSICAL ABILITIES QUESTIONNAIRE

(Continued)

Hands and Arms

1. Keep your hands still? Right? Left?
2. Open your hands? Right? Left?
3. Close your hands? Right? Left?
4. Hold your arms out to the side? Right? Left?
5. Hold your arms down? Right? Left?
6. Move your arms forward? Right? Left?
7. Bend your elbows? Right? Left?
8. Do all of the above? (Hands and arms--all)

Head and Neck

1. Keep your head straight up?
2. Keep your head in the center of your shoulders?
3. Tuck your chin?
4. Hold your head still?
5. Turn your head to the right 45 degrees?
6. Keep your neck straight up?
7. Turn your head to the left 45 degrees?
8. Bend your neck forward? Backward?
9. Bend your neck to the left? To the right?
10. Move head up and down?
11. Do all of the above? (Head and neck--all)

PHYSICAL ABILITIES QUESTIONNAIRE

(Continued)

Part 2. Facial Expression Can you:

Mouth and Face

1. Open your mouth?
2. Close your mouth?
3. Keep your lips together and relaxed?
4. Lick your lips?
5. Swallow?
6. Smile when you feel good or relaxed?
7. Do all of the above? (Mouth and face--all)

Eyes

1. Open your eyes?
2. Look at one person or thing for several minutes? (blinking is okay)
3. Squint your eyes?
4. Blink your eyes?
5. Show approval or disapproval using your eyes? (Eyes approval; Eyes disapproval)
6. Show questioning with your eyes?
7. Look to the right? Left? Up? Down?
8. Follow a moving object with your eyes without moving your head, neck, or body?
9. Do all of the above? (Eyes--all)

INVENTORY OF PHYSICAL ABILITIES
"I"

Name ______________________________ Date __________

A. STRENGTHS

1. Posture

Hips, Legs, Feet--________________________________

____

____

Back and Shoulders--______________________________

____

____

Hands and Arms--__________________________________

____

____

Head and Neck--___________________________________

____

____

2. Facial Expression

Mouth and Face--__________________________________

____

____

Eyes--____

____

____

Note. Student Step 3 & 5; Teacher Step 3

IMAGES PROMPT SHEET

FOR VERBAL REHEARSAL

I

M

A

G

E

S

Note. Student Step 4

WORKSHEET--NONVERBAL COMMUNICATION SKILLS

Name ______________________ Date ____________

SKILL ____

"M"

A. LIST physical skill requirements needed for success or a definition of the skill.

____

____

____

____

"A"

B. Is there an ability skill "Match"? YES or NO

C. Does the skill need to be modified? YES or NO

D. Does the way I do the skill need to be improved?

YES or NO

"G"

E. How will I improve or modify this skill?

Instructions--**THINK:**

WHAT?____

HOW?____

____

WHERE?____

WHEN?____

WHY?____

Note. Student Step 5; Teacher Step 3

CUE CARDS FOR "G"--GATHER IDEAS FOR DOING THE SKILL

TO IMPROVE MY IMAGE - **THINK:**

WHAT? ____________________

HOW? ____________________

____

WHAT? ____________________

HOW? ____________________

____

TO IMPROVE MY IMAGE - **THINK:**

WHAT? ____________________

HOW? ____________________

____

WHAT? ____________________

HOW? ____________________

____

Note. Student Step 5; Teacher Step 3

GOAL SHEET
"S"

Name ______________________________ Date __________

A. **SKILLS TO IMPROVE OR MODIFY**

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________

B. **GOALS**

1. Skill: ______________________________

____

____

____

____

____

____

____

2. Skill: ______________________________

____

____

____

____

____

____

<u>Note</u>. Student Step 5; Teacher Step 3

GOAL SHEET (Continued)

3. Skill: ______________________________

4. Skill: ______________________________

D. OTHER COMMENTS

STUDENT PERFORMANCE FORMS

IMAGES

GOAL STATEMENT

I WANT TO LEARN A STRATEGY

TO IMPROVE MY NONVERBAL

COMMUNICATION AND MY IMAGE.

SIGNATURE ______________________________

DATE ___________

Note. Student Step 1

STRATEGY COMPLETION PLAN

Name ____________________ Date ____________

Completion Dates — Phase I Behavior ______________________________

A - Goal — Phase II Behavior ______________________________

B - Completed — Phase III Behavior ______________________________

Phase I

	Orient	Describe	Model	Verbal Reh.	Prepare	Guided Prac.	Advance Prac.
A							
B							

Phase II

	Model	Verbal Reh.	Prepare	Guided Prac.	Advance Prac.
A					
B					

Phase III

	Model	Verbal Reh.	Prepare	Guided Prac.	Advance Prac.	Generalization
A						
B						

Note. Student Steps All

APPENDIX D
SIMULATED EDUCATION CONFERENCE SCRIPT

Orient Students to Week #1

Activities and Procedures for the Simulated Education Conference.

(Student's Name), this is (Interviewer). (Interviewer) will be helping with one part of this project called the education conference. (Interviewer's) job is to ask you questions about your school experiences. This week you will meet for about five minutes everyday. Some of the conferences will be videotaped. We want to get used to the video camera and find out what communication skills you have. It is improtant that you relax and pretend that the camera is not in the room. Later you will get to see the videotapes of these conferences. You will need to choose a different name to use while you are participating in the study and wear a name tag until we get used to your new name. Do you have any questions about what you will be doing?

Simulated Education Conference Directions

Opening statement.

Ask questions.

Verbally prompt students (spontaneously with no more than 2 prompts per question) as appropriate so that the student answers each question using several sentences.

The conference should last a minimum of 5 minutes.

Stop the conference as soon as possible after 5 minutes have elapsed (without interrupting the student).

Closing statement.

Opening Statement

Note. Start the timer.

Good (morning/afternoon), (student's name). Thank you for coming to this education conference. I'd like to know some of your opinions about school. I will ask you several questions. If I ask you a question that you have answered before, please answer it again. It is okay if your answers are different each time. There is not a time limit on your answers, but please answer the questions in complete sentences. Before we begin do you have any questions about what we are doing? Okay let's begin.

Closing Statement

That is all for today. Thank you for participating. Your teacher will let you know when your next project session will be.

Note. Stop the timer.

Simulated Education Conference Questions

<u>Academic Achievement</u>

1. WHAT LEARNING MATERIALS HAVE YOU FOUND HELP YOU LEARN BEST? (IE., LARGE PRINT TEXTBOOKS, STUDY GUIDES MADE UP BY THE TEACHER)
2. WHAT TYPES OF ACTIVITIES HELP YOU LEARN BEST? (IE., TEACHER PRESENTATIONS, GROUP ASSIGNMENTS, SMALL GROUPS, TEAMS, PARTNERS(2), FILMS, READING ALOUD HOMEWORK . . .)
3. HOW DO YOU STUDY FOR A TEST? (IE., READ EVERYTHING ONCE, MEMORIZE, FRIENDS ASK QUESTIONS)
4. WHAT DO YOU WANT TO WORK ON NEXT YEAR TO HELP YOU DO BETTER IN SCHOOL?
5. WHAT KIND OF TEST QUESTIONS DO YOU PREFER?
6. DO YOU USE A PARTICULAR METHOD TO HELP YOU DO A BETTER JOB ON TESTS?
7. WHAT MATH SKILL DO YOU THINK YOU HAVE IMPROVED ON MOST THIS YEAR? READING? WRITING?
8. WHAT HAVE YOU LEARNED THE MOST ABOUT IN SCIENCE?
9. WHAT HAVE YOU LEARNED THE MOST ABOUT IN SOCIAL STUDIES?
10. HOW IMPORTANT ARE GOOD GRADES?
11. ARE GOOD GRADES MORE IMPORTANT IN SOME CLASSES THAN OTHERS? WHY?
12. WHAT DO YOU THINK ARE YOUR STRONGEST LEARNING SKILLS? FOR EXAMPLE: WHAT ARE SEVERAL THINGS YOU DO WELL IN MATH? (ADDITION FACTS, MULTIPLICATION, WORD PROBLEMS) READING?

(ORAL READING, READ FAST, UNDERSTANDING, LEARNING VOCABULARY)

SCIENCE?

13. IN WHICH AREAS OF LEARNING DO YOU THINK YOU NEED TO IMPROVE?
14. WHAT PARTS OF WRITING ASSIGNMENTS GIVE YOU THE MOST PROBLEMS? EX: CHOOSING A TOPIC, GETTING STARTED, WRITING A SUMMARY, WRITING COMPLETE SENTENCES, WRITING PARAGRAPHS, USING A VARIETY OF VERBS, VOCABULARY, SPELLING.
15. WHAT ARE YOUR STRENGTHS IN MATH?
16. WHAT ARE YOUR WEAKNESSES IN MATH?
17. WHAT ARE YOUR STRENGTHS IN READING?
18. WHAT ARE YOUR WEAKNESSES IN READING?
19. WHAT ARE YOUR STRENGTHS IN STUDY SKILLS?
20. WHAT ARE YOUR WEAKNESSES IN STUDY SKILLS?

Friends

21. WHAT DO YOU LIKE MOST ABOUT YOUR FRIENDS?
22. WHAT CHARACTERISTICS ARE IMPORTANT IN FRIENDS?
23. WHAT MAKES A GOOD FRIEND?
24. WHAT MAKES YOU A GOOD FRIEND?
25. WHAT ARE YOUR WEAKNESSES IN THE AREA OF SOCIAL SKILLS? (IE., MAKING FRIENDS)

Classmates

26. WHAT DO YOU LIKE MOST ABOUT YOUR CLASSMATES?
27. WHAT THINGS DO YOU DISLIKE ABOUT YOUR CLASSMATES?

Teachers

28. WHAT CHARACTERISTICS ARE MOST IMPORTANT FOR TEACHERS TO HAVE?

29. WHAT DO YOU LIKE ABOUT YOUR FAVORITE TEACHER?

30. WHAT CHARACTERISTICS DO YOU DISLIKE IN TEACHERS?

Sports

31. WHAT SPORT DO YOU LIKE TO PLAY?

    WHY?

32. WHAT ARE YOUR FAVORITE SPORTS TO WATCH?

    WHY?

33. FOR TEENAGERS, HOW IMPORTANT IS IT TO PARTICIPATE IN SPORTS?

    WHY?

Classes

34. WHAT IS YOUR FAVORITE CLASS?

    WHY DO YOU LIKE IT?

35. WHAT ARE YOUR BEST SCHOOL SUBJECTS?

36. WHICH SUBJECTS ARE THE MOST DIFFICULT FOR YOU?

Classrooms

37. WHERE IN THE CLASSROOM DO YOU LIKE TO SIT DURING CLASS?

38. DO YOU SIT IN THE SAME PLACE IN THE CLASSROOM IN ALL OF YOUR CLASSES?

    (FOR EXAMPLE: DO YOU ALWAYS SIT ON THE FRONT ROW OR ON THE BACK ROW?)

39. DESCRIBE THINGS ABOUT A CLASSROOM THAT MAKE IT EASY FOR YOU TO DO YOUR BEST WORK. (IE., QUIET, LIGHTING, SPACE, TABLES, CHAIRS)

40. DESCRIBE THINGS ABOUT A CLASSROOM THAT MAKE IT DIFFICULT FOR YOU TO DO YOUR BEST WORK.

School

41. WHY IS SCHOOL IMPORTANT TO YOU? or
    WHY DO YOU LIKE SCHOOL? or
    WHAT DO YOU LIKE ABOUT SCHOOL?
42. WHAT DO YOU DISLIKE ABOUT SCHOOL? or
    WHY DON'T YOU LIKE SCHOOL?
43. WHAT WOULD YOU LIKE TO CHANGE ABOUT YOUR SCHOOL?

Yourself

44. WHAT DO YOU LIKE MOST ABOUT YOURSELF?
45. WHAT WOULD YOU LIKE TO IMPROVE IN YOURSELF?
46. HOW WOULD YOU DESCRIBE YOURSELF TO A PEN PAL?

Vocational skills

47. WHAT ARE VOCATIONAL SKILLS?
48. WHAT DO YOU WANT TO DO WHEN YOU GRADUATE FROM HIGH SCHOOL?
49. WHAT DO YOU WANT TO OR NEED TO DO TO ACCOMPLISH THIS GOAL?

Leisure/Recreation

50. WHAT DO YOU DO OUTSIDE OF SCHOOL FOR FUN?
51. ARE YOU INVOLVED IN ANY AFTER SCHOOL ACTIVITIES? (IE., SCOUTS)
    (IF YES) TELL ME ABOUT WHAT YOU DO.
    (IF NO) IS THERE A PARTICULAR REASON THAT YOU DON'T PARTICIPATE IN AFTER SCHOOL ACTIVITIES?
    IF TIME, TRANSPORTATION, ETC WERE NOT A PROBLEM, WHAT AFTER SCHOOL ACTIVITIES WOULD YOU BE INTERESTED IN?

APPENDIX E
SCORER OPERATIONAL DEFINITIONS OF NONVERBAL COMMUNICATION BEHAVIORS

<u>SITTING-UP-STRAIGHT</u>. Involves positioning of the torso shoulders, and head. It is assumed that the subject is sitting in a straight back chair with a firm seat or in a wheel chair.

Sitting up straight is defined as:

(a) torso straight

(b) hips and buttocks pushed back in chair seat

(c) shoulders parallel to hips, not hunched or rounded, and scapulae touching chair back

(d) head positioned over shoulders, erect or slightly tilted to the side.

<u>ARMS AND HANDS</u>. Positions include:

(a) arms unfolded

(b) upper arms adducted and approximately perpendicular to the floor or shoulder flexion of no more than 45 degrees

(c) elbows slightly flexed between approximately 45 and 135 degrees

(d) palms slightly extended and facing up with fingers relaxed or palms facing each other (fingers may be touching but not laced)

(e) hands resting on table

<u>or</u>

(f) hands resting in the subject's lap.

<u>LEANING FORWARD</u>. Includes the components of sitting-up-straight with the exception that the shoulder position is slightly forward of the hips and scapulae are not touching the chair back.

(a) the scapulae are approximately three or more inches from the back of the chair

(b) the waist or lumbar region will be away from the chair

(c) the forward lean should not exceed 45 degrees

(d) in an alternative position the subject is sitting toward the front of the chair and no part of the subjects' back is touching the chair back.

<u>EYE CONTACT</u>. Implies mutual glancing. The interviewer will be instructed to gaze continually at the subject. Eye contact occurs:

(a) any time the subject looks (eyes open) toward the interviewer

(b) with head positioned in the midline of the body and chin level.

<u>SMILE</u>. Is defined as:

(a) the corners of the mouth are pulled slightly back but the teeth are not exposed

<u>or</u>

(b) the corners of the mouth are pulled back and the upper lip exposes portions of the teeth.

<u>HEAD NODS</u>. Are defined as vertical movements of the head while the interviewer or teacher is speaking or in immediate response to the interviewer or teacher speaking. Horizontal rotation of the head, shaking the head, is not included in the definition. Head nods may be:

(a) a single quick nod

<u>or</u>

(b) a slow repeated nod

<u>or</u>

(c) several quick nods.

APPENDIX F
NONVERBAL COMMUNICATION BEHAVIOR RECORDING FORM

Nonverbal Communication Behavior Recording Form

Subject ______ Observer 1 ________________ Observer 2 ________________

Date ______________

Time Sampling (Occurrence -1; Nonoccurrence - Blank)
Time in 12 s intervals

	12	24	36	48	60	12	24	36	48	60	12	24	36	48	60	12	24	36	48	60	12	24	36	48	60
Interviewer Speaking																									
Eye Contact																									
Smile																									
Arms & Hands (Lap)																									
Arms & Hands (Table)																									
Sit-up																									
Lean																									

Interval Sampling (Occurrence -1; Nonoccurrence - Blank)

Head Nod																									

APPENDIX G
STRATEGY TRAINING SCORE SHEETS

IMAGES

VERBAL REHEARSAL CHECKLIST

Name ____________________

IMAGES STEPS	1	2	3	4	5	6
Inventory your physical abilities.	___	___	___	___	___	___
Make a note of skill requirements.	___	___	___	___	___	___
Ask if there are differences.	___	___	___	___	___	___
Gather ideas for doing the skill.	___	___	___	___	___	___
Evaluate your performance.	___	___	___	___	___	___
Set goals to use the skill.	___	___	___	___	___	___
Total	___	___	___	___	___	___
Percentage Correct	___	___	___	___	___	___
Date	___	___	___	___	___	___

(Attempts spans columns 1–6.)

	1	2	3	4	5	6
What is an image?	___	___	___	___	___	___
What is nonverbal communication?	___	___	___	___	___	___
Give example(s) of nonverbal communication behaviors?	___	___	___	___	___	___
Total	___	___	___	___	___	___
Percentage Correct	___	___	___	___	___	___
Date	___	___	___	___	___	___

Note. Student Step 4.

STEP 6 GUIDED PRACTICE AND FEEDBACK SCORE SHEET

Name ____________________ Session _________ Date __________

Behavior ______________________________

Scoring: Student receives (+) if the behavior is displayed most of the time while the question is being asked and answered.

<u>Note</u>. Head nods should occur while the instructor is asking the question or in immediate response to the instructor asking the question (but not continually).

Performance feedback after <u>every</u> question.

Directions: (a) Question set mastery requires a positive score (+) on 4 of 5 questions.

(b) When mastery is achieved on two consecutive question sets stop instruction for the day.

Question Sets

	A		B		C		D		E	
Question:	1	____	1	____	1	____	1	____	1	____
Question:	2	____	2	____	2	____	2	____	2	____
Question:	3	____	3	____	3	____	3	____	3	____
Question:	4	____	4	____	4	____	4	____	4	____
Question:	5	____	5	____	5	____	5	____	5	____
Total:		____		____		____		____		____
Percent Correct:		____		____		____		____		____

STEP 7 ADVANCED PRACTICE AND FEEDBACK SCORE SHEET

Name ____________________ Session _________ Date __________

Behavior ______________________________

Scoring: Student receives (+) if the behavior is displayed most of the time while the question is being asked and answered.

Note. Head nods should occur in response to the instructor asking the question (but not continually).

Performance feedback after every 5 questions.

Directions: (a) Question set mastery requires a positive score (+) on 4 of 5 questions.

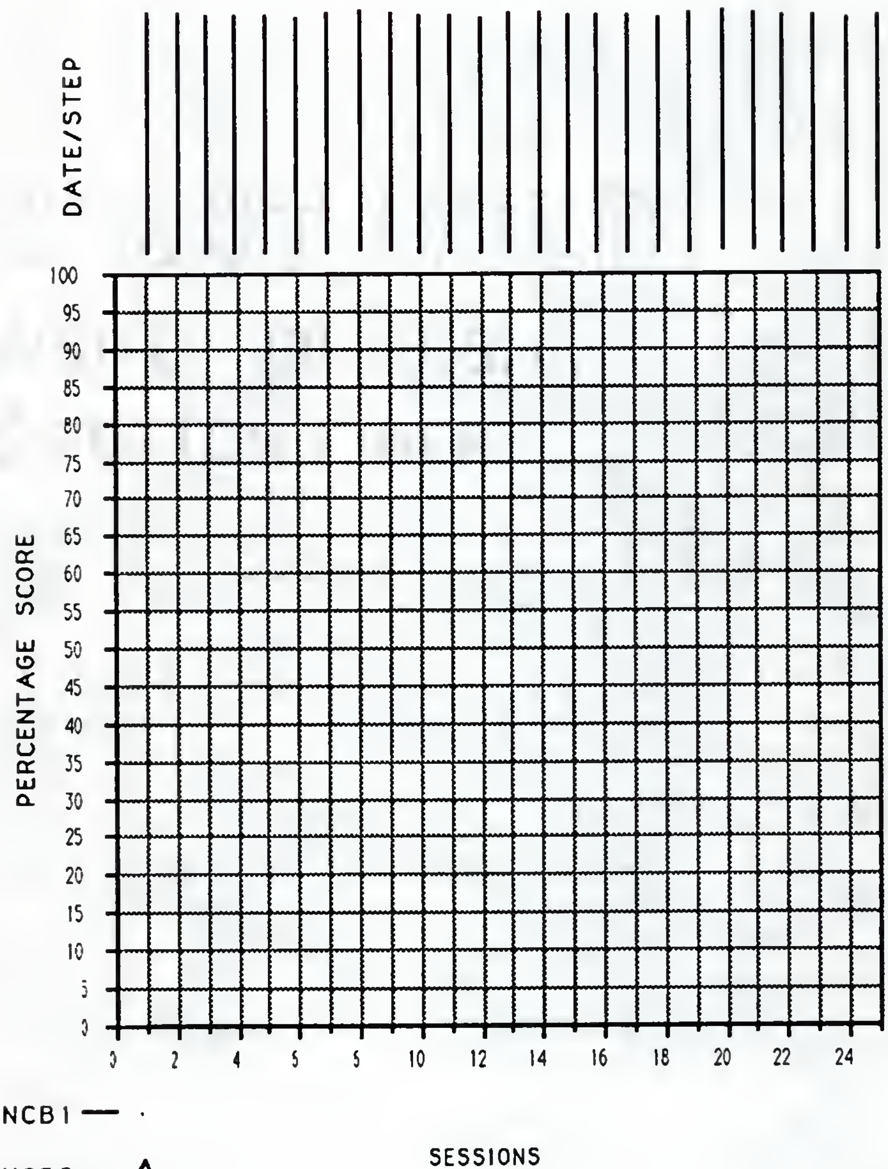
(b) When mastery is achieved on two consecutive question sets stop instruction for the day.

Question Sets

	A		B		C		D		E	
Question:	1	____	1	____	1	____	1	____	1	____
Question:	2	____	2	____	2	____	2	____	2	____
Question:	3	____	3	____	3	____	3	____	3	____
Question:	4	____	4	____	4	____	4	____	4	____
Question:	5	____	5	____	5	____	5	____	5	____
Total:		____		____		____		____		____
Percent Correct:		____		____		____		____		____

STUDENT PROGRESS CHART

NAME ______________________________



NCB1 — ·

NCB2 — △

NCB3 — □

APPENDIX H
STUDENT SATISFACTION QUESTIONNAIRE

Satisfaction Questionnaire

Student

Name ______________________________ Date __________

Directions: Place a check beside the response that best describes your opinion. Write any additional comments that support your opinions in the space provided at the end of the questionnaire.

1. Nonverbal communication is important during an education conference.

   definitely not ___ sometimes ___ definitely is ___

2. Nonverbal communication is important during classroom participation.

   definitely not ___ sometimes ___ definitely is ___

3. The IMAGES strategy helped me improve my nonverbal communication.

   definitely didn't ___ did a little ___ definitely did ___

4. I improved my nonverbal communication during an education conference.

   definitely didn't ___ did a little ___ definitely did ___

5. I improved my nonverbal communication during at least one of my classes.

   definitely didn't ___ did a little ___ definitely did ___

6. My teachers have noticed that I have improved my nonverbal communication skills.

   definitely have not ___ have a little ___ definitely have

7. My friends have noticed that I have improved my nonverbal communication skills.

   definitely have not ___ have a little ___ definitely have ___

8. My family has noticed that I have improved my nonverbal communication skills.

   definitely has not ___ has a little ___ definitely has ___

9. I could use the IMAGES strategy on my own to learn or improve other nonverbal communication skills.

   definitely could not ___ maybe ___ definitely could ___

10. I would recommend that other students learn the IMAGES strategy to help them improve their nonverbal communication skills.

    definitely would not ___ maybe ___ definitely would ___

11. I could use the IMAGES strategy on my own to improve other types of physical skills.

    definitely could not ___ maybe ___ definitely could ___

12. I would like to learn to use the IMAGES strategy to improve other types of physical skills.

    definitely would not ___ maybe ___ definitely would ___

Comments: ____

____

____

____

____

____

____

____

APPENDIX I
TEACHER SATISFACTION QUESTIONNAIRE

Satisfaction Questionnaire

Teacher

Name ______________________________ Date ______________

Student's Name ______________________

Directions: Place a check beside the response that best describes your opinion.

1. A student's nonverbal communication skills are important during an education conference.

   definitely are not ___ are a little ___ definitely are ___

2. The student improved his/her nonverbal communication during simulated education conferences.

   definitely didn't ___ did a little ___ definitely did ___

3. A student's nonverbal communication skills are important during class participation.

   definitely are not ___ are a little ___ definitely are ___

4. I have noticed an improvement in the student's nonverbal communication skills during at least one class.

   definitely have not ___ have a little ___ definitely have ___

5. The IMAGES strategy was helpful for improving the student's nonverbal communication.

   definitely was not ___ was a little ___ definitely was ___

6. I would recommend that other students learn the IMAGES strategy to improve their nonverbal communication.

   definitely would not ___ maybe ___ definitely would ___

   If "no", please explain ____________________________________

7. I would like to teach the IMAGES strategy to my students for improving their nonverbal communication during structured conference situations.

   definitely would not ___ maybe ___ definitely would ___

   If "no", please explain ________________________________

   ____

8. I would like to teach the IMAGES strategy to my students in order to improve their nonverbal communication during classroom participation.

   definitely would not ___ maybe ___ definitely would ___

   If "no", please explain ________________________________

   ____

9. I would like to teach the IMAGES strategy to my students in order to improve other skills that involve their physical abilities.

   definitely would not ___ maybe ___ definitely would ___

After watching a videotape of the student during simulated education conferences--before and after instruction in the IMAGES strategy--I noticed <u>improvements</u> in the following nonverbal communication skills:

(please check)

___ 1. Smiling

___ 2. Head nods

___ 3. Sitting-up-straight

___ 4. Leaning forward

___ 5. Appropriate positioning of hands and arms

___ 6. Eye contact with the interviewer

___ 7. Other

APPENDIX J
INTERVIEWER TIME SAMPLING RECORDING FORM

Observer ______________________________ Date __________

Interviewer ______________________________

Subject _____ Session _________

	30	60	30	60	30	60	30	60	%
1. Looking at Subject									
2. Smiling									
3. Following Script									
4. Fluent Pacing									

Interobserver reliability %:

Total _______ Occurrence _______ Nonoccurrence _______

Subject _____ Session _________

	30	60	30	60	30	60	30	60	%
1. Looking at Subject									
2. Smiling									
3. Following Script									
4. Fluent Pacing									

Interobserver reliability %:

Total _______ Occurrence _______ Nonoccurrence _______

APPENDIX K
STRATEGY TRAINER TIME SAMPLING RECORDING FORM

Observer ______________________________ Date __________

Teacher ______________________________

Subject _____ NCB ________________________ Step _________

	30	60	30	60	30	60	30	60	%
1. Following Script									
2. Following Sequence									
3. Fluent Pacing									
4. Using Materials									

Interobserver reliability %:

Total _______ Occurrence _______ Nonoccurrence _______

Subject _____ NCB ________________________ Step _________

	30	60	30	60	30	60	30	60	%
1. Following Script									
2. Following Sequence									
3. Fluent Pacing									
4. Using Materials									

Interobserver reliability %:

Total _______ Occurrence _______ Nonoccurrence _______

APPENDIX L
PERSONNEL TRAINING AGENDA

Individual training of personnel

1. Interviewer--conduct simulated education conferences.
2. Strategy trainer--conduct strategy instruction sessions.
3. Subject observers--score videotapes of simulated education conferences.
4. Personnel observers--score interviewer and strategy trainer on implementation guidelines.

I. Overview of personnel roles and project.

   A. Time commitments.

   B. Duties.

   C. General performance expectations.

   D. Subject characteristics.

   E. Site arrangements and introduction to regular school personnel.

II. Introduce materials and procedures.

III. Identify specific personnel behaviors.

   A. Overview.

   B. Demonstration.

   C. Guided practice and feedback.

   D. Independent practice and feedback.

IV. Observe and evaluate personnel performance.

A. Formal observations and feedback using Time Sampling recording form (Appendix J and Appendix K).

1. Interviewer.

2. Strategy trainer.

B. Informal observations and feedback

1. Subject observers.

2. Personnel observers.

V. On-going review of behavior and performance expectations for all personnel.

APPENDIX M
OUTLINE OF IMAGES INSTRUCTIONAL PROCEDURES

First Nonverbal Communication Behavior (NCB)

NOTE: Skill practice rates may vary for individual students. More than one step may be completed per session for students completing step criteria quickly enough to go on to the next training step. However only one practice step for an NCB should be completed per session per day. Once the student maintains a minimum 80% performance level for three consecutive practice sessions (guided and advanced), training in the current NCB is discontinued and training in the next NCB may begin. The session in which each step is completed should be documented for each student on the Strategy Completion Plan.

STAGE I: Strategy Instruction

1. Step 1: ORIENT the student to the purpose of an NCB acquisition strategy and the concept of an "image". Obtain student's commitment to learn the NCB acquisition strategy.

2. Step 2: DESCRIBE "IMAGES" strategy: Advance organizer. Do not mention specific behavior to be trained until Step 3 Model, but let student know that a total of three nonverbal communication behaviors will be part of learning the strategy, set goals for strategy

completion dates of all steps and target behaviors, and describe IMAGES NCB acquisition strategy.

I Inventory your physical abilities.

M Make a note of skill requirements.

A Ask if there are differences.

G Gather ideas for doing the skill.

E Evaluate your performance.

S Set goals to use the skill.

3. Step 3: MODEL: Advance organizer and review the purpose of a NCB acquisition strategy. Using the IMAGES strategy, model problem solving behavior to improve a specific NCB (the student's target skill NCB1). The student will complete "I" during Step 3: Model with the teacher's guidance.

"I" Use the Inventory of Physical Abilties and the Physical Abilities Questionnaire to identify and list strengths within each area.

"M" Use the Worksheet--Nonverbal Communication Skills to write skill requirements (a definition) for the first NCB under Part A.

"A" Demonstrate comparing Worksheet--Nonverbal Communication Skills to the Inventory of Physical Abilities to decide whether modifications or improvements are needed to accomplish the task/skill. Answer questions B,

C, and D on the Worksheet--Nonverbal Communication Skills.

"G" Write instructions for modifying or improving the nonverbal skill under Part E on the Worksheet--Nonverbal Communication Skills. Answer the questions What?, How?, Where?, When?, and Why? Make a cue card for the instructions using the Cue Cards for "G"--Gather ideas for doing the skill.

"E" Evaluate the effectiveness of the nonverbal skill performance using Education Conference Role Play Cards.

"S" Set goals to use the nonverbal communication skill during an education conference and during at least one class. Complete sections of the Goal Sheet including "Physical Skills to Improve or Modify" and "Goals".

4. Step 4: VERBAL REHEARSAL of IMAGES strategy components. Continue this step until student is fluent in naming the components of IMAGES steps. Use IMAGES Prompt Sheet for Verbal Rehearsal and Verbal Rehearsal Checklist.

5. Step 5: PREPARE. Advance organizer. Give student feedback on the first target NCB score during baseline probes. View videotape of one baseline session; only mention

one behavior. Instruct the student to complete all steps in the strategy for the first NCB. ("I" was completed during Step 3: Model but will be reviewed here.) Assist and guide in strategy steps as necessary. The strategy is designed to allow the student to problem solve and identify modifications of the target behavior as necessary to accommodate physical limitations. The teacher may give feedback about proposed modifications or improvements as requested but the student should primarily be responsible for determining the modifications or improvements. Record any modifications or improvements on the Worksheet--Nonverbal Communication Skills. Evaluate the student's performance using the Education Conference Role Play Cards. Assist student in setting goals to use the NCB during educational conferences and a normal class.

STAGE II: Skill Practice

6. Step 6: GUIDED PRACTICE and FEEDBACK on target behavior: Use Simulated Education Conference and Practice Questions. Use score sheet for Step 6: Guided Practice. Give feedback after every question until student displays the appropriate NCB for four out of five questions on two consecutive sets of questions (ie., Guided Practice "mastery"). Stop for the session. Record date goal completed for Step 6 on

the Strategy Completion Plan. Instruct student to graph percentage score for the last two question sets on the Student Progress Chart.

If student completes three consecutive trials without displaying the appropriate NCB on any, go back to Step 5, "G": (a) stop and reevaluate student's potential for physically achieving the specified behaviors as written; (b) modify instructions for performing target behavior or retain target behavior as previously stated; (c) repeat Guided Practice and Feedback.

7. Step 7: ADVANCED PRACTICE and FEEDBACK: Use conference questions used in Guided Practice, Step 6. Give feedback to student after every 5 questions (instead of after each question)

Step 7 mastery requires correct behavior performance on 80% of the questions in a set (4 of 5) for two consecutive question sets. Use score sheet for Step 7: Advanced Practice. Instruct student to graph percentage score on the Student Progress Chart for the last two question sets of the session. Repeat Step 7 for at least one session beyond mastery performance for Step 7 to demonstrate stability or improvement of the NCB performance.

Second NCB

STAGE I: Strategy Instruction

8. Step 3: MODEL: Advance organizer and review purpose of a NCB acquisition strategy as well as IMAGES steps. Revise goals for strategy completion dates. Model using the IMAGES strategy with a second behavior. Encourage student to prompt teacher actions.

9. Step 4: VERBAL REHEARSAL: Brief review. Use Verbal Rehearsal Checklist.

10. Step 5: PREPARE: Advance organizer. Give student feedback on the second target NCB score during baseline probes. View videotape of one baseline session (should use the most recent videotape). Instruct the student to complete the steps in the strategy for the second NCB. Use the Inventory of Physical Abilities from NCB1. Strengths should be the same. The second target behavior should be completed on another Worksheet--Nonverbal Communication Skills and strategy components for "M-A-G-E-S" completed. Assist and guide in strategy steps as necessary. The teacher may give feedback about proposed modifications or improvements as requested but student should primarily be responsible for determining the modifications or improvements. Record any modifications or improvements on the Worksheet--Nonverbal Communication Skills. Evaluate

student's performance using Education Conference Role Play Cards. Assist student in setting goals to use the NCB during educational conferences and classes.

STAGE II: Skill Practice

11. Step 6: GUIDED PRACTICE and FEEDBACK on target behavior: Emphasis for scoring and feedback is NCB2, but feedback for NCB1 should also be included. Use Simulated Education Conference and Practice Questions. Use score sheet for Step 6: Guided Practice. Give feedback after every question until student displays the appropriate NCB for four out of five questions on two consecutive sets of questions (ie., Guided Practice "mastery"). Stop for the session. Record date goal completed for Step 6 on the Strategy Completion Plan. Instruct student to graph percentage score for the last two question sets on the Student Progress Chart.

If student completes three consecutive trials without displaying the appropriate NCB on any, go back to Step 5, "G": (a) stop and reevaluate student's potential for physically achieving the specified behaviors as written; (b) modify instructions for performing target behavior or retain target behavior as previously stated; (c) repeat Guided Practice and Feedback.

12. Step 7: ADVANCED PRACTICE and FEEDBACK: Emphasis for scoring and feedback is NCB2 but verbal feedback should be given for NCB1. Use Simulated Education Conference and Practice Questions used in Guided Practice, Step 6. Give feedback to student after every 5 questions (instead of after each question).

Step 7 mastery requires correct behavior performance on 80% of the questions in a set (4 of 5) for two consecutive question sets. Use score sheet for Step 7: Advanced Practice. Instruct student to graph percentage score on the Student Progress Chart for the last two question sets of the session. Repeat Step 7 for at least one session beyond mastery performance for Step 7 to demonstrate stability or improvement of the NCB performance.

Third NCB
(Steps are the same as those in NCB2)

STAGE I: Strategy Instruction

13. Step 3: MODEL: Advance organizer and review purpose of a NCB acquisition strategy as well as IMAGES steps. Revise goals for strategy completion dates. Model using the IMAGES strategy with a third behavior. Encourage student to prompt teacher actions.
14. Step 4: VERBAL REHEARSAL. Brief review. Use Verbal Rehearsal Checklist.
15. Step 5: PREPARE. Advance organizer. Give student feedback on the third target NCB score during baseline probes.

View videotape of one baseline session (use the most recent videotape). Instruct the student to complete the steps in the strategy for the third NCB. Use the Inventory of Physical Abilities from NCB1. Strengths should be the same. The third target behavior should be completed on another Worksheet--Nonverbal Communication Skills and strategy components for "M-A-G-E-S" completed. Assist and guide in strategy steps as necessary. The teacher may give feedback about proposed modifications or improvements as requested but student should primarily be responsible for determining the modifications. Record any modifications on the Worksheet--Nonverbal Communication Skills. Evaluate student's performance using Education Conference Role Play Cards. Assist student in setting goals to use the NCB during educational conferences and classes.

STAGE II: Skill Practice

16. Step 6: GUIDED PRACTICE and FEEDBACK on target behavior: Emphasis for scoring and feedback is NCB3, but feedback for NCB1 and NCB2 should also be included. Use Simulated Education Conference and Practice Questions. Use score sheet for Step 6: Guided Practice. Give feedback after every question until student displays the appropriate NCB for four out of five questions on two consecutive sets of questions (ie., Guided Practice "mastery"). Stop for the

session. Record date goal completed for Step 6 on the Streategy Completion Plan. Instruct student to graph percentage score for the last two question sets on the Student Progress Chart.

If student completes three consecutive trials without displaying the appropriate NCB on any, go back to Step 5, "G": (a) stop and reevaluate student's potential for physically achieving the specified behaviors as written; (b) modify instructions for performing target behavior or retain target behavior as previously stated; (c) repeat Guided Practice and Feedback.

17. Step 7: ADVANCED PRACTICE and FEEDBACK: Emphasis for scoring and feedback is NCB3 but verbal feedback should be given for NCB1 and NCB2. Use Simulated Education Conference and Practice Questions used in Guided Practice, Step 6. Give feedback to student after every 5 questions (instead of after each question).

Step 7 mastery requires correct behavior performance on 80% of the questions in a set (4 of 5) for two consecutive question sets. Use score sheet for Step 7: Advanced Practice. Instruct student to graph percentage score on the Student Progress Chart for the last two question sets of the session.

Repeat Step 7 for at least one session beyond mastery performance for Step 7 to demonstrate stability or improvement of the NCB performance.

18. Step 8: GENERALIZATION

Part I: Briefly review all behaviors and material learned during the IMAGES strategy training. Guide the students in setting a goal to use <u>all</u> of the newly acquired nonverbal communication skills during education conferences <u>and</u> also during their classes.

Part II: Immediately before or on the day of an actual education conference briefly review the student's goal to use specific nonverbal communication skills during an education conference. Tell the student that he/she will have the opportunity to accomplish/meet his/her goals during the education conference to be held that day. Ask if the student has any questions about the upcoming conference. Elicit the student's commitment to use the nonverbal skills during the actual education conference. Ask if the student has any questions about the upcoming conference.

APPENDIX N
IMAGES SCRIPTED LESSON SAMPLE

STEP 3: MODEL

MATERIALS

IMAGES Information Sheets #15 - #20: Nonverbal behavior definitions (as appropriate for target behavior)

IMAGES Information Sheet #7 "I"

Physical Abilities Questionnaire

Inventory of Physical Abilities

IMAGES Information Sheet #8 "M"

Worksheet--Nonverbal communication Skills

IMAGES Information Sheet #9 "A"

IMAGES Information Sheet #10 "G"

IMAGES Information Sheet #11 "G" (continued)

IMAGES Information Sheet #12 "Cue card for Step "G""

IMAGES Information Sheet #13 "E"

Education Conference Role Play Cards

IMAGES Information Sheet #14 "S"

Goal Sheet

1. REVIEW THE PREVIOUS LESSONS. ASK THE STUDENT(S) TO:
   A. DEFINE "IMAGE".
   B. EXPLAIN WHY A PERSON'S IMAGE IS IMPORTANT.
   C. DEFINE "NONVERBAL COMMUNICATION."

D. EXPLAIN WHY NONVERBAL COMMUNICATION IS IMPORTANT (INCLUDE "EDUCATION CONFERENCE").

E. SPELL IMAGES.

F. NAME THE STEPS OF THE IMAGES STRATEGY.

G. TELL WHAT THE IMAGES STRATEGY WILL HELP THEM DO.

H. DEFINE "MAKE AN INVENTORY".

2. ADVANCE ORGANIZER

Last time we met we talked about the steps of the IMAGES strategy. Today I am going to demonstrate how I can use the steps of the IMAGES strategy when I want to improve my nonverbal communication or my image. I will expect you to pay close attention and follow along on <u>your</u> **worksheets. You will complete the "Inventory" step on your worksheets today with me. You will complete the rest of the IMAGES steps and your other worksheets when we get to Step 5: PREPARE.** [Introduce set of worksheets - ie., point out materials you will be using. <u>Note</u>: If this is the second or third target behavior, the Inventory will be <u>reviewed</u> (<u>instead</u> of completed again). Adjust script as necessary to reflect that a second or third target behavior is being taught. Reinforce previously learned behaviors as new behaviors are taught.]

3. INTRODUCE SPECIFIC NONVERBAL COMMUNICATION BEHAVIOR

The first thing I need to do is select a nonverbal behavior that I want to improve. [Use one of the student's target behaviors for the demonstration] **(<u>Target behavior</u>) is important during an educational conference so I want to use the IMAGES strategy to help**

me improve my (target behavior). Why would (target behavior) be important during an educational conference? [Elicit appropriate responses for posture or facial expressions such as: sitting up straight/leaning forward sends a message to the teacher that I am alert, interested, confident, and ready to participate; eye contact/head nods/smiling send the message that I am paying attention, or interested, or alert, or understand what is being said; the things I do with my hands and arms send the message that I am being honest, open, or that I am relaxed, not tense] **A definition for (target behavior) is . . ."** [Use IMAGES Information Sheets #15 - #20 as appropriate. Explain the components of the definition as necessary for student understanding. for example: eye "contact" means eyes "touching", "meeting", etc.] **Write the definition of (target behavior) in your notes.** [or "you can refer to the information sheet in your folder"]

4. DEMONSTRATE IMAGES STRATEGY

[Pause periodically and check for student understanding. Gradually have the student(s) direct your actions. Instruct student to take Physical Abilities and Inventory of Physical Abilities sheets out of their folders]

a. **Now I will demonstrate how to use the IMAGES Strategy to improve my (target behavior). I will "think" aloud so you will know what to do when you use the strategy. Follow along on your worksheets and we'll do the first step of the strategy together. The first step of the strategy is "Inventory your physical**

abilities". As I write on my Physical Abilities and Inventory sheets you will write on yours. [Use IMAGES Information Sheet #7. Note: If this is the second or third target behavior, review the Physical Abilities Inventory completed previously. Emphasize area of functioning on the Inventory that is pertinent to the new target behavior. Then go directly to 4B--M "Make a note of skill requirements.] **I need my Inventory of Physical Abilities sheet and the Physical Abilities Questionnaire.** [Refer to Physical Abilities Sheet] **The physical abilities sheet has a list of questions about things that I can do physically. What does physically mean?** [Elicit response] **Right. Physically means "things I can do with my body". The sheet has two parts--POSTURE and FACIAL EXPRESSION. What is POSTURE?** [Elicit response] **What is meant by FACIAL EXPRESSION?** [Elicit response, then continue] **The section on posture has questions about your feet and legs, back and shoulders, hands and arms, and head and neck. The section on facial expression has questions about your mouth, face, and eyes. Why is it important to inventory your physical abilities before you begin to learn a nonverbal communication skill like (target behavior) or other physical skills?** [Elicit response] **That's right you need to know if there are some things that may cause problems when you try to do the new skill. In other words you will know if you're able to do that skill. For example, I'm not very tall. I have difficulty reaching things on high shelves. If a job I want to do requires that I get things off high shelves I would want to know**

that because I am not very tall, I may have problems. But I also might be able to think of a way that I can reach high places. For instance I could use a stool or a ladder. Because I know my physical abilities I can also think of ways that I can do certain things even Though I'm not very tall. I can modify the way I get things from high places. [Elaborate on this example as necessary. Involve the student where possible--for example the students could make suggestions for reaching things in high places.] Okay . . . I have to read the questions about my physical abilities and then write the things I can do well under "Strengths" on my inventory. I'll begin with "Posture". Lets see . . . "Lower Extremities" . . . that must mean my feet/legs and hips. I'm going to read all the questions in this section and check the things I can do. Then I'll write my strengths on the inventory. Okay . . . number one is "Can I keep my feet flat on the floor?" Yes, I can do that so I'm going to put a check on question one. If you can do that you will check your sheet also. [Continue in a like manner for questions 2-4. The student(s) should check their sheet for their own abilities] Number 5 "Can I do all of the above?" I checked them all so I am going to write beside Hips, Feet and Legs on my inventory because that is what is underlined. [Write on inventory] Now I'm ready to do "Back and Shoulders". The first question is "Can I keep my back straight up when sitting in a chair?" Yes, I can do that, so what am I going to do? [Elicit response from student such as "put a check by number one." Encourage the student(s) to answer their

questions as you go. If the student understands the process the instructor may discontinue using personal responses and focus only on the student's response. The student(s) should complete the questionnaire as student and instructor discuss each question for the student. If the student cannot perform all of the abilities in a section, list only the items he/she can do on the inventory sheet. Write only underlined words and letters to abbreviate]

b. **Now that you and I have listed physical abilities on the Inventory Sheet we are ready for the next step M "Make a note of skill requirements".** [Use Images Information Sheet #8] **I'll think aloud again and want you to help me, but you will complete your other materials on another day. You may put your worksheets away for now. For this step I need the Worksheet, and the definition for (target behavior). First I write (target behavior) beside "skill" at the top of the page. Next I write a definition of (target behavior) in Part A: "List physical skills needed for success or a definition of the skill."** [Write on Worksheet "Skill" and Part A] **The definition of (target behavior) is . . .** [See IMAGES Information Sheet #15 - #20] **I have finished Step M "Make a note of skill requirements. I have made a note of the requirements for (target behavior). I am ready to go to Step A. What does the A stand for?** [Elicit response. Use IMAGES Information Sheet #9]

c. **That is correct. Step A is "Ask if there are differences." Hmm ... I have to compare the requirements of (target behavior) to my strengths. I still need the Worksheet and I also need my**

Inventory of Physical Abilities. [Answer questions B, C, and D - yes, no, yes by comparing the skill requirements for (target behavior) with the "strengths" listed on the inventory sheet. For example: . . .] **When I look at the definition of the skill and compare it to my Inventory of Physical Abilities, is there any reason why I can't do this skill? In other words do I have what I need to (target behavior). If I have what I need then there is an "Ability-skill Match" and I will circle yes for question B. If there is an Ability-Skill Match then I do not have to modify the skill, so I will circle "No" for question C.** [Refer to previous example of modification for short person to reach high shelves--if necessary for student understanding of question C.] **Does the way I (target behavior) need to be improved? When I watched a video of myself during an education conference I noticed that I was not (target behavior-ing) very well . . . so . . . yes I think I need to improve the way that I (target behavior). I will circle "yes" to answer question D.** [Use a similar procedure to compare skill requirements with strengths if there is not an "ability-skill" match. However if answer to B is no then answer to C is yes. Answer to D is probably always yes--otherwise there is no need for student to learn the (target behavior).] **I have completed Step A "Ask if there are differences".**

d. **Now I'm ready for step G. What is Step G?** [Elicit response] **That's right. Step G is "Gather ideas for doing the skill".** [Use IMAGES Information Sheet #10] **There aren't any differences between**

my abilities and the skill requirements. Are there any other reasons that I'm not able to perform the (target behavior). Well, I have a headache but that shouldn't keep me from (target behavior) . . . and I do need to improve my (target behavior) so I'll just write some instructions to myself to help me remember to use (target behavior) during an education conference. These questions--What?, How?, Where?, When?, and Why?--will help me write instructions for (target behavior-ing). The first question is What? I'll write (target behavior) on this line because it is the new nonverbal communication skill that I what to learn. Let's see . . . next I need to write How? to (target behavior). I need to write a few words that will be a cue to me . . . that will help me think about How to (target behavior). The thing I want to think about the most when I'm (target behavior-ing) is (for example: "shoulders" for sit-up-straight) so I'm going to write (for example: "shoulders") on my Worksheet beside How? I'm also going to write the cue on this cue card. I can take this cue card with me to help me think about (target behavior-ing) in an education conference. When I see this cue it reminds me to . . . (for example: keep my shoulders back). [Make physical response to the cue as you say it] Next I need to decide Where? I want to be sure to (target behavior). I want to (target behavior) at an education conference so I'll write "education conference" in my instructions beside Where? Okay I've decided What, How, and Where to (target behavior) but I/m not finished yet. I still have to decide When

during an education conference that it is particularly important to (target behavior). Let's see . . . it's important to (target behavior) when (for example: "someone is speaking to me and when I am speaking to them") so I'm going to write "while I listen and talk" in my instructions beside When? [This answer may vary somewhat--could also be "during questions and answers" etc. For Head nods this should be only "When I'm listening" or "When someone speaks to me".] **Now I know What?** [Elicit response] **How?** [Elicit response] **Where?** [Elicit response] **and When?** [Elicit response]. **Mmmm I also want to remember Why? It's important to (target behavior) during an education conference.** [Elicit response or continue] **I want to (target behavior) during an education conference so that I can improve my image. I'll write "to improve my image" beside Why?** [Elaborate on this as appropriate for the student(s). Discuss briefly why having a good image is important at an education conference.] **Great! I have finished Step G "Gather ideas for doing the skill".** [Use Images Information Sheet #12 and point to each question as you say . . .] **I know that I want to (target behavior) by thinking about my (cue), during an education conference . . ., while I am listening and speaking . . ., so that I can improve my image!** [Elicit instructions to write in Part E of the worksheet from the student. A paraphrase of the (target behavior) requirements or other special reminder is appropriate]

e. **Now I have some ideas about how to (target behavior). I am ready for Step E. What does the E tell me to do?** [Elicit response. Use IMAGES Information Sheet #13] **Great! E tells me to evaluate my performance. What does "evaluate mean"?** [Elicit response: judge the value of something or how good it is] **That's right I need to judge how well I can (target behavior) if I follow the directions that I've written. I'd better try out my instructions for (target behavior). You can help me by asking me some questions that I might hear at an education conference and telling me how I'm doing on (target behavior).** [Use two or three Education Conference Role Play cards. Evaluate your performance and also ask for the student's feedback. Use examples and non-examples of the target behavior to demonstrate evaluating performance.] **Okay. I'm pretty good at that. I think I'm ready to go on to Step S. What if I couldn't do (target behavior) yet? What would I do?** [Elicit response: "Go back to Step G". "Gather more ideas on how to (Target behavior)." Write different instructions.]

f. **What do I do in Step S?** [Elicit response. Use IMAGES Information Sheet #14] **That's right! I set goals to (target behavior) during education conferences. I only need the Goal Sheet. In Part A "Skills to Improve or Modify" I write (target behavior). Next I write a goal for (target behavior) in Part B.** [Write "I will (target behavior) during education conferences."] **I need to set a goal to use my new nonverbal communication behavior--**

(target behavior)-- in education conferences so that I can improve the image my teachers have of me. But wait I'm not finished. Are there other places where I could improve my image by (target behavior-ing)? [Elicit responses such as "during class"; "when I want to make a good impression"; "when I ask my teacher (etc.) for something special"; etc.] **I'm going to write a goal to (target behavior) when I . . .** [Use one of the student's responses]

5. REVIEW STRATEGY STEPS AND QUESTIONS ON VERBAL REHEARSAL QUIZ SHEET [Write the date on the Student's Strategy Completion Plan for completing "Model". Tell student(s) that the next step is "Verbal Rehearsal" and they need to practice saying the steps of IMAGES.

APPENDIX O
IMAGES INFORMATION SHEETS

IMAGE

(IMAGES INFO #1)

I M A G E

* A MENTAL PICTURE OF SOMEONE

* HAS A MESSAGE

(IMAGES INFO #2)

COMMUNICATION

* VERBAL - WITH WORDS

* NONVERBAL -

  WITHOUT WORDS

(IMAGES INFO #3)

IMAGES

GOAL STATEMENT

I WANT TO LEARN A STRATEGY TO IMPROVE MY NONVERBAL COMMUNICATION AND MY IMAGE.

(IMAGES INFO #4)

I M A G E S

(IMAGES INFO #5)

I M A G E S

I INVENTORY YOUR PHYSICAL ABILITIES

M MAKE A NOTE OF SKILL REQUIREMENTS

A ASK IF THERE ARE DIFFERENCES

G GATHER IDEAS FOR DOING THE SKILL

E EVALUATE YOUR PERFORMANCE

S SET GOALS TO USE THE SKILL

(IMAGES INFO #6)

IMAGES

I NVENTORY YOUR

PHYSICAL ABILITIES

* ANSWER

  THE PHYSICAL ABILITIES

  QUESTIONS

* WRITE

  THE THINGS YOU CAN DO WELL

(IMAGES INFO #7)

I M A G E S

MAKE A NOTE OF

SKILL REQUIREMENTS

* WRITE

THE NAME OF THE NONVERBAL

COMMUNICATION BEHAVIOR

* LIST

THE PARTS OF THE NONVERBAL

COMMUNICATION BEHAVIOR

(IMAGES INFO #8)

I M A G E S

A SK IF THERE ARE DIFFERENCES

* COMPARE

THE NONVERBAL BEHAVIOR SKILL

REQUIREMENTS TO YOUR

"STRENGTHS"

* ASK

ARE THERE ANY DIFFERENCES

BETWEEN YOUR ABILITIES AND

THE SKILLS NEEDED TO PERFORM

THE NONVERBAL BEHAVIOR?

(IMAGES INFO #9)

I M A G E S

G ATHER IDEAS FOR DOING THE SKILL

* IF THERE ARE NOT ANY DIFFERENCES BETWEEN YOUR ABILITIES AND THE SKILL REQUIREMENTS:

  1. ARE THERE ANY OTHER REASONS THAT YOU ARE NOT ABLE TO PERFORM THE NONVERBAL SKILL?
  2. WHAT WILL YOU NEED TO DO TO PERFORM THE NONVERBAL BEHAVIOR? WRITE INSTRUCTIONS.

(IMAGES INFO #10)

I M A G E S

G ATHER IDEAS FOR DOING THE SKILL (CONTINUED)

* IF THERE ARE DIFFERENCES BETWEEN YOUR ABILITIES AND THE SKILL REQUIREMENTS:

1. ARE THERE ANY PARTS OF THE SKILL REQUIREMENTS THAT YOU CAN DO?

2. WHAT CAN YOU DO INSTEAD OF THE SKILL PARTS THAT ARE OUTSIDE OF YOUR ABILITY? WRITE INSTRUCTIONS.

(IMAGES INFO #11)

NONVERBAL COMMUNICATION

THINK:

WHAT? ______________________________

HOW? ______________________________

WHERE? ______________________________

WHEN? ______________________________

WHY? ______________________________

(IMAGES INFO #12)

I M A G E S

E VALUATE YOUR PERFORMANCE

CAN YOU PERFORM THE NONVERBAL

BEHAVIOR FOLLOWING THE

INSTRUCTIONS ON YOUR

WORKSHEET?

* IF YOU CAN GO ON TO THE NEXT STEP "S".
* IF YOU CANNOT, GO BACK TO STEP "G" AND WRITE NEW INSTRUCTIONS FOR BEHAVIOR

(IMAGES INFO #13)

I M A G E S

S ET GOALS TO USE THE SKILL

* WRITE THE NAME OF THE NONVERBAL SKILL.

* WRITE A GOAL TO USE THE NONVERBAL COMMUNICATION BEHAVIOR IN EDUCATION CONFERENCES.

* ARE THERE OTHER PLACES WHERE THE NONVERBAL BEHAVIOR WOULD BE USEFUL? IF SO, WRITE A GOAL.

(IMAGES INFO #14)

NONVERBAL BEHAVIOR DEFINITION

SIT UP STRAIGHT

a. Hips and buttocks pushed back in chair seat.

b. Back is straight.

c. Shoulders are "squared".

(Not hunched or rounded)

d. Shoulder blades touch the chair back.

e. Head is

- over shoulders.
- straight up or slightly tilted.

(IMAGES INFO #15)

NONVERBAL BEHAVIOR DEFINITION

LEAN FORWARD: Same as sitting up straight except:

a. Shoulders are slightly forward--not touching back of chair.

b. Waist is away from chair back.

c. Forward slant is not more than 45 degrees

or

a. Sitting toward front edge of chair and

b. No part of back and shoulders is touching the chair back.

(IMAGES INFO #16)

NONVERBAL BEHAVIOR DEFINITION

RELAX HANDS AND ARMS

a. Arms are unfolded.

b. Upper arms are hanging down or reaching slightly forward.

c. Elbows are slightly bent and not on the table.

d. Palms are slightly extended and

* facing up with fingers relaxed

or

* facing each other with fingers slightly touching.

e. Hands are resting on table or in lap.

(IMAGES INFO #17)

NONVERBAL BEHAVIOR DEFINITION

SMILE

a. With lips together

or

b. With lips apart and teeth showing.

(IMAGES INFO #18)

NONVERBAL BEHAVIOR DEFINITION

EYE CONTACT

a. Keep head in midline.

b. Chin level.

c. Open eyes.

d. Look at the interviewer.

(IMAGES INFO #19)

NONVERBAL BEHAVIOR DEFINITION

NOD YOUR HEAD

a. Head moves up and then down.

b. May be one quick nod.

c. May be slow and repeated several times.

d. May be several quick nods.

(IMAGES INFO #20)

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BIOGRAPHICAL SKETCH

Stephanie L. Carpenter was born in Yokosuka, Japan, on September 25, 1955. The oldest of four children in a U.S. Navy family, she attended eleven schools in five states before graduating from Opelika High School, Opelika, Alabama in 1973. She received a B.S. degree in special education from Auburn University in 1977 and the Master of Science in Exercise and Sport Sciences from the University of Florida in 1988.

While raising her two children born in 1976 and 1977, Mrs. Carpenter has intermittently taught children with special needs. From 1980 to 1981 she taught English as a Second Language to elementary school students in Monterey, California, for one school year. Later she taught junior and senior high school special education classes for three years, 1984 to 1987, in Jacksonville, North Carolina. Her students included mentally retarded, learning disabled, physically impaired and behaviorally/emotionally disturbed adolescents. She has served as a graduate assistant in the Department of Special Education, College of Education, University of Florida since 1988. In the future Mrs. Carpenter plans to continue research in special education.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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